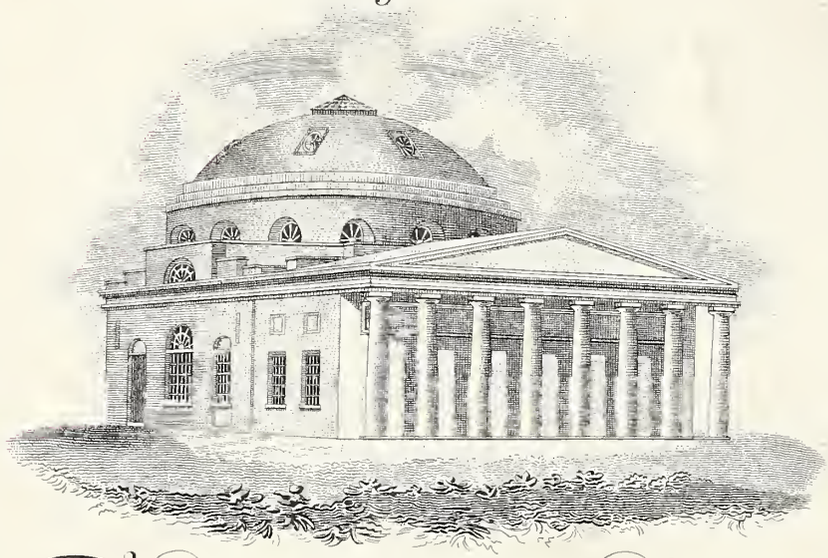
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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine, and Minneapolis Surgical Society

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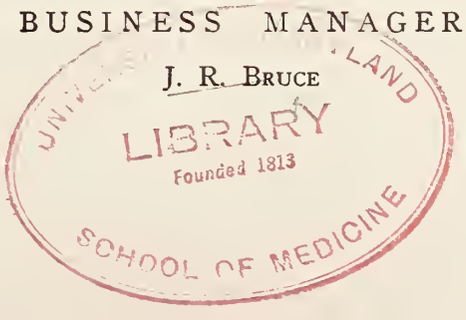
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MINNESOTA MEDICINE

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CAUSES OF BLINDNESS IN MINNESOTA*

CHARLES E. STANFORD, M.D.

Minneapolis, Minnesota

THE factors responsible for blindness in the group applying for financial aid as needy blind have been studied to determine how much blindness is possibly preventable or remedial.

The examination of the applicants was done by those practicing ophthalmology in the various cities throughout the state. It is therefore through the coöperation of these physicians that these data have been secured.

Causes of blindness may be classified in several ways. Of most importance from the prevention of blindness viewpoint is an etiologic grouping of causes, while from a remedial aspect the descriptive or anatomic classification is of most value.

At the time this study was made there were 768 detailed records available. That number is now somewhat larger, but the percentages are affected very little. Only cases considered eligible for aid from a visual standpoint were included.

ETIOLOGIC FACTORS IN BLINDNESS

	Cases	Per Cent
Infectious diseases	241	31.3
Trauma	104	13.5
Toxic poisoning	3	.4
Neoplasms	16	2.0
Non-infectious systemic diseases	43	5.4
Congenital and hereditary origin	176	22.9
Etiology undetermined or not specified	185	24.
	768	100.

Each of the above groupings can be broken down as follows:

*From the State Bureau for Aid to the Blind and the Department of Ophthalmology, University of Minnesota. Read at the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

Infectious Diseases

	Cases	Per Cent
Gonorrhea	2	
Measles	6	
Meningitis	10	
Ophthalmia neonatorum	37	4.7
Septicemia	1	
Focal sepsis, etc.	12	
Syphilis—prenatal	10	7.4*
Syphilis—acquired	47	
Syphilis—clinical diagnosis only	27	
Scarlet fever	1	
Trachoma	19	2.4
Ocular tuberculosis	11	
Other infections specified	13	
Infectious causes, type not specified	40	

*Syphilis (prenatal, acquired and clinical diagnosis only) as a group, form 10.9 per cent of cases.

*Trauma**

	Cases	Per Cent
Non-industrial injuries	56	7.3
Industrial injuries	48	6.2
Types of non-industrial accidents		
Injuries at play and sports	33	4.1
Household activities	4	
Street and traffic	3	
Birth injuries	2	
All others	14	

*See sympathetic ophthalmia—topographic classification.

Non-Infectious Systemic Diseases

	Cases	Per Cent
Anemia	1	
Diabetes	11	1.4
Nephritis	1	
Vascular diseases	8	
Central nervous system diseases	4	
Disorders of pregnancy and labor	9	1.2
Other systemic diseases—specified	5	
Other systemic diseases—not specified	4	

Congenital and Hereditary Factors

	Cases	Per Cent
Congenital	83	10.8
Known hereditary	43	5.8
Hereditary origin—presumed†	46	6.1
Consanguinity	1	
Not specified	3	

†Eye condition usually considered hereditary but for which, in these cases, the family history was negative.

Etiology Undetermined

	Cases	Per Cent
Unknown to science*	114	14.8
Undetermined by physician†	49	6.4
Not specified	22	2.8

*Includes (1) Senile cataracts which might be otherwise classified as due to age changes, etc.; (2) Glaucoma; (3) Cases of optic atrophy known to have been studied exhaustively.

†Includes largely those cases, long blind, seen by examiner years after causative factor existed. Topographical diagnoses such as phthisis bulbi, optic atrophy, etc.

DESCRIPTIVE OR ANATOMIC CLASSIFICATION

Causes of Blindness—Topographic Classification

	Cases	Per Cent
Eyeball	219	28.5
Cornea	86	11.0
Iris and ciliary body	76	9.8
Crystalline lens	83	10.8
Choroid and retina	126	16.4
Optic nerve	174	22.6
Vitreous body	2	
Miscellaneous and ill-defined	2	
	768	100.

This larger grouping can be broken down to the following:

Eyeball

	Cases	Per Cent
Glaucoma	76	9.8
Refractive errors, chiefly myopia	31	4.
Developmental anomalies	33	4.1
Albinism	6	
Anophthalmos	3	
Megalophthalmos	5	
Microphthalmos	4	
Aniridia	4	
Colobomata	1	
Others—specified	6	
Others—not specified	4	
Disorganized eyeball (phthisis, etc.)	76	9.8
All others	3	

Lesions of the Cornea

	Cases	Per Cent
Interstitial keratitis	9	1.1
Keratitis—type not specified	13	1.7
Ulcerative keratitis	35	4.3
Pannus	15	1.9
Other affections specified	13	1.7

Iris and Ciliary Body

	Cases	Per Cent
Iridocyclitis	38	4.9
Iritis	4	
Sympathetic ophthalmia	34	4.2

Crystalline Lens

	Cases	Per Cent
Cataract*	79	10.3
Ectopia lentis	4	

*Includes 35 cases of congenital cataract.

Choroid and Retina

	Cases	Per Cent
Choroiditis	4	
Retinitis	13	1.7
Chorioretinitis	33	4.1
Detached retina	19	2.4
Central vessel occlusion	2	
Retinal degeneration	54	7.0
Other affections—specified	1	

Optic Nerve

	Cases	Per Cent
Optic atrophy	160	20.7
Optic neuritis	4	
Neuroretinitis	8	1.
Other affections	2	

INFECTIOUS DISEASES AND BLINDNESS

241 Cases

Ophthalmia neonatorum 37, syphilis 84, and trachoma 19, total 140 cases or 58 per cent of the blind in this group. Theoretically this 58 per cent (18 per cent of all blind) is entirely preventable blindness.

Ophthalmia neonatorum is now much less a cause of blindness than the above figure would indicate. The majority of those blind from syphilis are adults, affected in the fourth and fifth decades. Early and adequate treatment of primary syphilis could materially reduce this number. The trachoma group are largely among our Indian population. The incidence of the disease (trachoma) is considerably greater than the number of blind from it would indicate.

Of the forty-eight blind from industrial injuries 73 per cent are in the 21-49 year group.

Of the thirty-four classified as blind from sympathetic ophthalmia following injury to one eye, twenty-eight fall in the non-industrial group and of these nineteen were injured at play or in sports. It is an established fact that the most effective treatment for sympathetic ophthalmia is prevention. This means prompt and adequate care of all eye injuries no matter how apparently trivial they may seem. While blindness from this cause is infrequent in comparison with the total number of eye injuries, it is possible to eliminate it entirely.

Neoplasms caused blindness in sixteen cases, fourteen due to intracranial tumors. The average duration of blindness for these fourteen is seven years; in all cases vision was lost before operation was performed; in seven cases with visual changes as initial symptom a proven diagnosis of pituitary tumor has been established. The duration of visual disturbances before diagnosis in five cases with adequate histories ranged from one to five years.

Glaucoma as a cause of blindness (seventy-six cases—9.8 per cent) is probably too low a figure due to the number of blind on old age relief. It is significant to note that the records show twenty-two cases neglected to seek adequate medical care, and that in practically all cases in which operations were done, these were performed so

TRAUMATIC FACTORS IN BLINDNESS

Non-industrial Injuries	Age at Onset of Blindness						
	0-1	2-9	10-14	15-20	21-49	50-64	Total
Play or sport	0	15	7	6	5	0	33
Household accidents	0	2	0	1	1	0	4
Street and traffic	0	0	1	1	1	0	3
Birth injuries	2	0	0	0	0	0	2
Others specified	0	0	2	4	6	1	13
Others—not specified	0	0	0	0	0	1	1
Totals	2	17	10	12	13	2	56

late in the disease that very little vision was saved. Both the public and the physician must become more aware of the early symptoms and signs of this disease before the number of blind from glaucoma can be materially reduced.

Cataracts as primary causes of blindness, aside from the thirty-five due to congenital and familial factors, were recorded in only forty-four cases. This low figure is in part due to the number on old age relief and in part to the excellent surgical care that has been rendered to these people throughout the state. The majority of the forty-four cases are inoperable due to complications. A few have had complications during or after operation or have retinal or optic nerve changes as well.

A review of the cases blind from complications of non-infectious systemic diseases illustrates very well the participation of the eye in systemic disease and the need for careful eye examinations by physicians in all types of disease. Prevention of blindness from these causes, anemia, diabetes, nephritis, vascular disease, etc., must come from careful control by the physician with intelligent coöperation by the patient.

After careful analysis of 768 cases of blindness as to cause, age of onset, and degree of visual acuity, and realizing that little or nothing can now be done to restore vision to these people, the thesis "prevention of blindness" comes home with considerable force. Possibilities in prevention are:

1. A parentage free from serious familial eye disorders.

2. In instances in which an offspring of apparently normal parents has a serious eye defect, present at birth—and commonly familial—limitation of the number of further offspring is indicated. The occurrence of from two to six siblings, blind at birth, as illustrated in this report, is inexcusable.

3. Routine Wassermann tests on *all* expectant mothers and prompt institution of anti-syphilitic therapy in all mothers with positive reactions will reduce the number of blind from "congenital syphilis."

4. Continued use of the "Crede" method for prevention of ophthalmia neonatorum is imperative. Ophthalmia neonatorum now means that either the drops were not used or were inadequately used.

5. Blindness from trauma could be materially reduced. Most of our industrial accidents occur among independent workers and farmers upon whom no safety rules are imposed. Neglect of minor injuries until serious complications arise causes a large percentage of the cases of monocular blindness in this group.

The non-industrially blind are largely the result of thoughtlessness and chance-taking acts of childhood and youth. Prompt care of all those so injured may prevent many cases of blindness.

6. Inflammations of the iris and ciliary body (iritis and iridocyclitis) may be due to a variety of causes. The number of blind from this cause could possibly be reduced by: (1) more prompt seeking of medical advice by the patient; and (2) earlier diagnosis and intensive therapy.

7. Glaucoma—prevention of blindness from this cause depends entirely upon *early* diagnosis and prompt institution of treatment plus a thorough understanding by the patient of the need for continuing under observation and therapy.

All measures intended for a betterment of the public health are, therefore, an integral part of a prevention of blindness program.

GLAUCOMA*

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THIS brief talk has been planned to help physicians who are not eye specialists in recognizing glaucoma. It is not meant for ophthalmologists.

Every year many patients lose vision more or less completely from glaucoma. In many the vision might have been retained had the condition been recognized in time and proper treatment instituted. In general, it may be said that vision lost through glaucoma cannot be regained. It can also be stated that when glaucoma is recognized, visual loss can usually be prevented.

Glaucoma is a symptom and not a disease. It is an obstruction and like some other obstructions is dangerous. The causes are many and variable, some known and more or less completely understood, while others are poorly understood, and some causes probably remain completely unknown.

At the risk of over-simplification, we shall consider glaucoma as due to obstruction of aqueous drainage at the filtration angle. There is much more to it than this, but such a theory is practical for our purpose, and we simply haven't time to go into other factors, such as rigidity of the sclera, swelling of the lens, congestion of vascular beds, abnormal chemistry, or over-production of the aqueous humor, and so on.

The physiology of the aqueous circulation is briefly and simply about as follows. The aqueous humor is produced in the region of the ciliary body. It circulates through the interior of the eye, bathing and nourishing the vitreous body and lens. It then passes forward through the pupil into the anterior chamber where it enters a convection eddy. It leaves the eye through the filter in the pectinate ligament, which is located just anterior to the root of the iris, passing into the canal of Schlemm and thence back into the venous circulation.

When the outflow of aqueous humor from the filtration angle is obstructed, it accumulates within the eye, and the intraocular pressure (spoken of as tension) rises. This might occur from fouling of the filter by floating particles. It might also occur if the root of the iris should make contact with the posterior surface of the cornea, and overlie the filter through any considerable part of the circumference, as sometimes happens. Both factors might act together to impede drainage of the aqueous humor.

Increasing the intraocular pressure materially above normal has several very serious effects. The weak spot in the eyeball, where the nerve head enters, gives way to a certain extent, and the nerve head becomes pushed back, forming the so-called glaucomatous cup. This, in turn, subjects the nerve fibers in the nerve head to abnormal pressure and to certain tensions. They apparently become stretched across the non-yielding edge of the scleral ring about the nerve head. This blocks certain fibers and bundles of fibers, and the resulting loss of function produces various types of geometric scotomata. These are called neuroscotomata. Another effect of the increased pressure is a reduction in blood supply to the retina. A large part of the retinal blood supply enters the eye through the ophthalmic artery at a normal systolic pressure, variously estimated at between 65 and 80 mm. of mercury. The normal intraocular pressure is in the neighborhood of 25 mm. Given a normal blood pressure of 70 and a normal intraocular pressure of 25, the effective pressure at which the blood enters the eye on the crest of the systolic wave would be 70-25 or 45 mm. Should the intraocular pressure increase to 50 and the blood pressure remain the same, then the effective pressure remaining for the nutrition of the retina would be reduced to 20 mm. at the crest of the systolic wave. Further, there is probably an interference with the return of tissue fluid into the venules. Whether reduced blood volume or interference with return circulation of tissue fluid is more important does not concern us now. The fact remains that the retina is deprived of sufficient nutrition, and function is interfered with or lost. The result in the visual field is concentric contraction and certain branching scotomata called angio-scotomata. You will recall that the retina embryologically is a portion of the

*Read before the annual meeting of the Minnesota State Medical Association, Rochester, Minnesota, April 24, 1940.

brain. Like the brain, when its cells or fibers are destroyed, they are not restored. When retinal nerve fibers and cells are destroyed through pressure or lack of nutrition, or both, they are not replaced, and their function is lost forever. Therefore, we say that, in general, vision lost through glaucoma is not recovered.

There are three types of glaucoma ordinarily recognized, namely, primary, secondary, and congenital. We shall confine ourselves to the primary.

Primary glaucoma is subdivided in classification into "congestive" and "non-congestive" or "simple." The congestive in turn is subdivided into acute and chronic. The non-congestive is always chonic.

Acute congestive glaucoma occurs in attacks of more or less violence. Before the patient suffers much there is usually an extended period of minimal prodromal attacks. These are characterized by redness, some discomfort, and temporary reduction in vision. Eventually there comes a real attack, when the patient suffers one of the severest pains known to man. This pain is in, about, or back of the eye and radiates through the entire side of the head. The eye is red, lacrimation is increased, every light has a halo about it, and vision is greatly reduced. If severe enough, nausea, vomiting, and chills may result. Sometimes precious time is lost, while other causes for these symptoms are sought. When the physician arrives, he finds: (1) marked scleral congestion; (2) lacrimation; (3) shallow anterior chamber; (4) a steamy or cloudy cornea which is anesthetic (if the intraocular pressure is high enough); (5) pupil in mid-dilation and reacting poorly; (6) increased intraocular pressure. The first five of these symptoms are more or less familiar to all of you and can be readily recognized. I know of no good reason why the last—intraocular pressure—could not also be more familiar. You all test surface cellulitis for fluctuation in search of accumulations of pus. The technic of testing ocular pressure is the same. If one can readily feel fluctuation in an eyeball, the pressure is probably normal. If the eye feels hard, and slides about like a marble under the lid, the pressure is high. If it is not hard, but on the other hand you cannot be sure of fluctuation, the pressure may be and probably is moderately elevated. Try it on your own eyeballs with both forefingers. In order to be sure that you are palpating the sclera and not the cornea, which is important, turn your eyes well downward.

The treatment of glaucoma is instillation of miotics, some drug or drugs which have the property of contracting the pupil, thus drawing the root of the iris out of the filtration angle as far as possible. A solution of 1 per cent pilocarpin nitrate (or hydrochloride) is a very good and practical preparation. It can be instilled every ten or fifteen minutes for several hours until the attack subsides. Operation for the purpose of producing an artificial drain or filter or for removal of a portion of the iris at the root may later be necessary.

Differentiation between iritis and congestive glaucoma is important. The former calls for atropin to dilate the pupil. To instill atropin in acute glaucoma is a fatal mistake. Some years ago I saw a patient with acute congestive glaucoma in whom a mistaken diagnosis of iritis had been made, and atropin had been instilled. When I arrived, the pupil was in extreme dilation and the patient in extreme pain. Fortunately, the retaina had not yet been destroyed, and the situation was saved by operation. The patient has a useful eye after twelve years, but the pupil still remains in complete dilation. The best points in differentiation lie in the iris. In glaucoma the iris looks almost normal, and the pupil is dilated; whereas in irititis the iris markings are blurred because of swelling, and the pupil tends to contract. In irititis congested vessels can often be seen in the iris itself, and adhesions may be found between the pupillary margin and the lens. If you cannot be sure of the diagnosis, it is better to instill hypertonic salt solution or Lewis's solution, or do nothing at all until consultation with an ophthalmologist may be had. Fortunately, when acute glaucoma is severe enough to seriously damage the retina, the patient is in such extreme pain that both patient and physician do something about it.

Chronic congestive glaucoma simply consists in a progression of the acute attacks to the point where the intraocular pressure doesn't return to normal between attacks. The attacks continue to recur with more or less severity.

Simple non-congestive glaucoma is much less severe than the congestive type but, because of its insidious onset and progress, may be much more dangerous from the standpoint of eventual

visual loss. It is about ten times as frequent as the inflammatory. You meet it much oftener in your practice and probably miss it usually. This is because it is so frequently entirely symptomless. One is almost at a loss in advising what steps should be taken by way of precaution.

Doubtless the ophthalmologist also misses some cases. He picks up many in routine refractions by palpating the eyeball or measuring the intraocular pressure. I dismissed a patient from the hospital just last week whose glaucoma had been found in the course of routine refraction. When he came in requesting refraction he had no suspicion that there was anything other than refractive error present. The tonometer revealed increased intraocular pressure in both eyes—left greater than right. When put on treatment with miotics, the right eye responded nicely, but the left eye tended to maintain an elevated pressure and loss of visual field continued progressively. The left eye was therefore operated upon.

Some times the ophthalmologist can only suspect the presence of glaucoma even after a complete examination with the special diagnostic methods in his office. He may then resort to certain provocative tests. Even with no symptoms and minimal signs, glaucoma may be well established already. It seems to me that many of these symptomless cases must inevitably continue to be missed by the family physician, even though he may see the patient from time to time for other things.

When symptoms begin, they consist of: (1) reduced vision; (2) scotomata; (3) reduced dark adaptation; (4) reduced color sense, but no redness or lacrimation. By the time the patient is aware of these symptoms, retinal damage may already be considerable. Such patients go seeking a pair of glasses. It is the responsibility of the examiner to discover the true nature of the difficulty. One of the most serious indictments of the indiscriminate fitting of glasses lies in the fact that glaucoma at this stage, when most of the vision can still be saved, is so frequently missed. Unless the refractionist is competent to recognize early glaucoma, it is inevitably and invariably missed. Later when it is so advanced that useful vision is already largely gone, it is often suspected for the first time that there is something other than refractive error affecting the eye.

If you examine the eyes of such a glaucoma patient who has minimal symptoms you will find that the pressure is elevated in both. Simple glaucoma is bilateral, although the pressure is usually greater in one eye. The anterior chamber is shallow. The pupil is normal or dilated. Fundus examination reveals a glaucomatous cup in the nerve head. You may be able to tell that the visual field is contracted by rough tests even without a perimeter.

By special tests the ophthalmologist finds in addition: (1) free pigment in the anterior chamber; (2) adhesions in the filtration angle between the iris and the posterior corneal surface; (3) atrophy of the iris; (4) atrophy about the disc in the fundus; (5) on the perimeter, visual field alterations both as to form and color, and scotomata.

The treatment again is pilocarpin, eserine, or some other miotic. If this controls the pressure well, and if the patient can be depended upon to use the drops, no operation is necessary.

The patient must realize, however, that his eyes must be treated for the rest of his life. Some patients begin in all seriousness but some times become careless and neglectful. To illustrate. A 60-year-old carpenter from a nearby city came in on account of reduced vision in the right eye. That was in 1925. A study revealed simple glaucoma that could be fairly well, but not completely, controlled with miotics. Operation was advised, but he refused, so he was carefully instructed in care of the eye, and dosage was carefully adjusted for him. He continued treatment for a while but after a time became careless, did not return for check-ups, but instead had several changes of glasses. Seven years later he returned with pain and redness in the right eye, which had, meanwhile, become entirely blind. The pressure was found to be about 80. The left eye was also definitely glaucomatous, but this time the patient consented to operation, and the second eye was saved.

In a short discussion of this nature it is not possible to say a great deal about glaucoma, but it is hoped that after this little review you may suspect the trouble more often and help to save the vision of these patients who mistakenly assume that they only need a change of glasses. If any of your patients over thirty-five years of age complain of reduced vision or blind spots, keep these few things in mind: Glaucoma oc-

curs in the latter half of life, and untreated glaucoma leads to irreparable blindness, usually with no pain and with but few symptoms. Don't tell your patient that this reduced vision is due to age. Visual acuity remains unaltered to advanced age unless pathological conditions arise within the eye. Don't tell him that it is due to cataract and that he may postpone treatment until his vision is reduced to counting fingers even though he may have signs of cataract. Most glaucoma patients also have cataracts. Don't send him out to change his glasses merely, but insist upon a competent and thorough examination. If you can recognize, or even suspect, glaucoma, you will have rendered your patient an inestimable service. For him, it may mean the difference between vision and blindness.

SENILE CATARACT*

E. W. HANSEN, M.D.

Minneapolis, Minnesota

WHEN a person is told that there is a cataract developing in one or both eyes, he often throws up his hands in horror. How often some member of the family, or even the family physician, when an elderly person comes for an eye examination, warns the ophthalmologist not to tell the patient there is a cataract, if one is present. "Anything else but that," they say. If the truth were known, "anything else but" is a much more serious condition than uncomplicated cataract formation.

One should be very sure, in the first place, that any progressive loss of vision in an elderly person is due to lens changes. We see people who haev been told that they had cataracts and must wait until they are "ripe." When they come for operation, they are almost or entirely blind, not from cataracts, but from a chronic simple glaucoma. Other serious lesions are those in the retina, circulatory changes, senile macula degeneration, arteriosclerosis and hypertension. Patients with cataracts, and the public generally, should be told that cataracts are not the most serious eye condition they can have, but belong at the other end of the scale, among the less serious. Almost all uncomplicated cataracts can be removed with relatively little discomfort to the patient and with resulting good vision.

Senile cataract is a name given to the change which occurs in the crystalline lens producing a hard and, eventually, opaque lens. It results from repeated insult to the lens structure by chemical, mechanical, thermal, photogenic, or nutritional factors. It is not merely a degenerative change taking place with increasing years, but a real pathological condition. While the greatest number of cases occur in patients who are around seventy years of age the same condition obtains in patients in the forties or even earlier.

A good deal of work has been done, much in the past decade, on the chemistry of the lens, and the experimental production of cataract. From this we know of chemical changes which take place in normal lens as compared with cataractous lenses, particularly an increase in cholesterin and in sodium and calcium salts, especially the phosphates, and a decrease in potassium. We see the changes which occur in lenses of diabetic patients, causing changes in refraction, and, in some, a rapid development of opacity, true diabetic cataract. In others we have a more slowly developing cataract, in every respect like the so-called senile cataract, which should probably be called senile cataract in a diabetic patient rather than diabetic cataract.

The lens has no blood supply, and its nutrition must be maintained by osmosis from the intra-ocular fluids which surround it. The capsule of the lens acts as a semipermeable membrane, allowing passage of nutriment into the lens and the discharge from the lens of the products of its metabolism. Any interference with this process causes the lens fibers to become opaque. Such a marked change in the balance of osmotic pressure takes place in diabetes, resulting in swelling and opacity in the lens.

Experimental work on lenses has shown that ultra-violet rays from the quartz mercury vapor arc, ordinary sunlight to a lesser extent, and

*Read at the annual meeting of the Minnesota State Medical Association, Rochester, April 24, 1940.

infra-red rays slightly, ionize lens material making the phosphate ions electronegative. By uniting with positively charged calcium ions in the lens, insoluble calcium phosphate is formed.

Other experimental work has shown that cataracts can be produced in animals by feeding lactose, and even more rapidly with galactose. It has been shown further that if vitamin C, and more especially, if cystine is added to the diet in these rabbits that there is an appreciable delay in the cataract formation. Galactose causes a diminution of the sulf-hydryls (glutathione and cystein) necessary to the oxidative and reducing process in the lens. The addition of yeast, rich in glutathione, of cystine alone, or of vitamin C, definitely stayed the process of opacification of endocrine dysfunction is well known.

We know that cataracts can develop from electric shock, from irradiation with x-ray and radium, in glass blowers, and more frequently in tropical countries where there are more ultraviolet rays in sunlight than in more temperate regions. The possibility of cataract development on an allergic basis, as seen in cases of more or less generalized eczema also should be mentioned. Cataract formation in various types of endocrine dysfunction is well known.

All this experimental and clinical evidence shows the effect on the lens capsule and on the lens substance. It seems very likely that the ordinary senile cataract is a cumulative result of one or of a combination of factors in the daily life of individuals whose lenses are subjected to repeated insults.

From this it can be seen that there may be a wide range in the age period when cataracts develop, and in the rate of progress of lens changes. The younger the patient and the slower the development, the more difficult is the handling of the case.

Up to the present time the medical treatment of cataract has been very disappointing. Many substances have been used such as drops, powders for insufflation, subconjunctival injections and internal medication. I do not believe I have ever seen a case in which I could be sure that the development of cataract was arrested by medical treatment, although various observers have reported arrested development and even clearing of opacities. I do know that it has been, unfortunately, a lucrative field for charlatans.

This does not mean that one should not treat the patient in whom cataracts are developing. The general health should be looked after, particularly hygienic and dietary factors. Dionin solutions may be used as drops instilled into the conjunctival sac. In the incipient and immature stages in those cases where the opacity is mostly central the pupil can be dilated during the daytime with a weak homatropine solution, allowing for some vision with the clearer peripheral portion. If this is done, the tension of the eye must be watched.

While the vitamins C and G (B) have been shown to have an influence in the formation of experimental cataracts, their use in treatment up to the present time has shown no definite results. They may be tried, however, especially in the very early stages of lens change, with some hope of influencing the morbid process. As the work in this field is continued, there is reason to hope that we will have a helpful agent in the combating of senile cataract, at least when seen in its early stages.

The most important consideration in the treatment of patients with senile cataract has always been surgery. Judgment as to time of operation must be exercised. If one eye remains useful, the more involved eye should not be operated in an immature state. If both progress about equally and the patient is incapacitated one cataract should be removed. If one eye goes over to hypermaturity while the other is still useful, the lens should be removed, depending on the age and condition of the patient. There are too many factors involved in this problem to permit further consideration in the short time we have.

In the pre-operative care of the patient, the general health should be built up as well as possible. Foci of infection, especially teeth, should be eradicated. While some surgeons feel that there is little danger from such foci when they have been present for some time I have a healthy respect for the damage that may be done by postoperative endogenous infection. I still believe the possibility of trouble is greater from these, than from infection in the conjunctival sac. The latter, however, should be cleaned up. An infected lacrymal sac should be removed. If the patient is a diabetic, the sugar should be reduced to a minimum.

As to the surgery itself little need be said. I believe that for the most part, the classic operation with removal of the lens from the capsule

is safer than the intracapular operation, if the surgeon does not do a great many operations. Arnold Knapp reported that vitreous loss was definitely greater in 500 intracapsular operations than in those receiving extracapsular extraction. His comment is as follows:

"The complication of the intracapsular operation which may be traced to the operative technic is a severe and definite form of iridocyclitis due to traction on the ciliary body. The greater number of cases of loss of vitreous with its complications can be reduced by better anesthesia and greater experience. Glaucoma is much less frequent than with the extracapsular operation. The question of the relative frequency of detachment of the retina is open. The dire late consequences after the intracapsular operation which have been repeatedly brought forward by some writers cannot be substantiated by facts."

Summary

1. Senile cataract is a disease of the crystalline lens and not merely a degenerative process of old age.

2. Medical treatment of this disease of the crystalline lens has been disappointing.

3. Experimental work on cataract formation is giving us hope of more satisfactory treatment of this common eye condition.

4. Cataract surgery, in otherwise uncomplicated eyes, is successful in most instances, and patients should not be left to live in dread of blindness or fear of operation.

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SQUINT IN RELATION TO LOSS OF VISION*

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CENTRAL or macular vision begins to develop at the end of the second post-natal month and such development continues until the end of the sixth or seventh year. Vision is established after this age. The occurrence of squint before the normal and complete establishment of vision is accompanied by amblyopia or loss of vision in the squinting eye if the squint is monocular. Since amblyopia, or loss of vision, is common in convergent and rare in divergent squint, the discussion of amblyopia is almost entirely concerned with convergent squint. Likewise the main characteristics of convergent squint are amblyopia and poor fusion, fusion being the ability to get a single cerebral impression when objects fall on corresponding portions of the retina. These factors are only rarely present in divergent squint.

Amblyopia in squint is directly proportional to the age at which the squint occurs—the younger the individual the more rapid the loss and the more profound the amblyopia. Children who squint in the first or second year lose all vision in a month or two and children of six or seven years lose little or none. The cause of the amblyopia is a central scotoma or blind spot of approximately ten degrees corresponding in size to the papilo-macula bundle of the optic nerve. Toxic amblyopia, due to alcohol, tobacco, quinine, lack of vitamin B and multiple sclerosis have some of the same clinical characteristics as amblyopia of squint.

In addition to the central scotoma, contraction of the visual field is also present. Congenital amblyopia, or congenital failure of the central vision to develop, may occur with or without the presence of squint. Such cases, however, do not

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show shrinking of the peripheral fields when not associated with squint. It is not to be inferred, however, that the congenital amblyopia is the cause of squint for in the majority of instances the amblyopia is not the cause but the result of the squint. In the two case histories which follow, both children had a definite congenital amblyopia, although squint never occurred in either case. Other factors beside amblyopia itself are necessary for the production of squint.

Case 1.—B. C., aged six, complained of no symptoms, but his parents were advised to have his eyes examined by his school teacher.

Examination revealed the following—Vision: Right, 20/20; Left 10/200. Retinoscopy: Right + 350S + 50 × 90 = 20/20; Left + 600S + 125 × 100 = 8/100. Muscle balance: There was no deviation either for distant or near vision. Treatment consisted of constant occlusion for nine months. There was no improvement in vision.

Case 2.—F. K., aged 7, was brought for examination because the family thought his eyes were weak. He had had smallpox and impetigo when ten days old and one eye was slightly red at that time. Vision: Right, 10/100; Left, 20/20. Muscle balance: Eyes showed no deviation on screen test and have never crossed. Retinoscopy: Right + 50S; Left + 25S + 25 × 90.

The cause of the central scotoma is entirely theoretical as no opportunity has ever been presented for microscopic study. Many feel that the amblyopia is dependent upon some defect in the optic nerve itself. Professor Tscherning expressed this belief to me personally some years ago and was of the belief that some anatomical change would be found if one were fortunate enough to secure such a specimen for microscopic examination. He believed, also, that the improvement in vision was entirely a matter of education. Others compare the loss of vision to the inability of deaf mutes to talk. If hearing is lost before four years of age the child will certainly be mute. If hearing is lost after four years and before seven, mutism will probably be present and if after seven years the child will talk even though he is not able to hear.

My personal feeling on the subject is that amblyopia is most often a functional disturbance or a mental adjustment of the individual in order to prevent diplopia. It is surprising that when the two eyes have equality of vision that alternating rather than monocular squint occurs and suppression of the image, or central scotoma is present only in the deviating eye. When the deviating eye fixes, the central scotoma disappears spontaneously. This type of central scotoma can also be demonstrated in individuals who are using a monocular microscope in which both eyes remain open but only one eye fixes, or in many individuals who use one eye for reading; consequently reading has a tendency to be more of a monocular than a binocular effort.

It is also important to remember that in alternating squint where one eye changes more rapidly than the other the squint may become monocular and amblyopia result. Then, too, the functional nature of amblyopia can definitely be demonstrated by the recovery of normal vision after occlusion of the fixing eye or by the complete loss of vision in an occluded eye which was previously normal. The following history represents such a case:

Case 3.—J. W. The eyes of this patient began to turn shortly after birth. On first examination at two years he had a 25 degree convergent squint in the right eye and a marked amblyopia. The left eye was immediately occluded and such occlusion was continued for one and one-half years. No examination had been made for one year, and when seen at this time the vision in the right eye was normal and the left eye practically nil. At four years of age, occlusion was changed to the right eye but it was never possible to improve the vision in the left eye, which had been occluded for a long period of time, without an examination. The vision in the right eye has remained normal and the vision in the left eye 4/200 and not improved. Surgical correction was necessary to correct the cosmetic defect.

Much speculation has occurred concerning the age at which vision may be recovered when the loss is due to amblyopia. It is generally considered that little vision is regained after the seventh year although there are many cases reported which indicate that such recovery may take place at a later age. It is important, however, to remember that some individuals do not have a definite scotoma but the vision is held in abeyance only because of a high refractive error which improves readily a few months after correction of the error has been made. When true amblyopia exists with a definite central scotoma, the vision which is regained after ten or eleven years of age is entirely inadequate for the individual to carry on many of the useful pursuits of life. Such is represented by the history given in Case 4.

Case 4.—M. M. developed convergent strabismus at three years and when first seen had a convergent strabismus of the right eye and a marked amblyopia. At eleven years of age she developed a choroidal tubercle in the left macula area with relapses in the next five years until the vision of the left eye became 20/200. Original vision of 20/200 in the right, or amblyopic eye, which had been used for the past nine years, has been checked at frequent intervals since that time and has never improved beyond 20/50, while the left eye remained at approximately 10/200 without central fixation due to the macular lesion.

There are far too many cases of amblyopia in every community and much of the fault rests entirely with the medical profession. Advising parents to wait until school age, when squint occurs at two or three years of age, is as false as postponing treatment in any acute disease. Such advice must, however, have arisen with the profession itself.

That amblyopia can be relieved in some, if not in all cases, is shown by the following case histories along with approved methods of treatment:

Case 5.—J. J. developed convergent strabismus at nineteen months and had had part time occlusion up to five years of age at which time the vision was: Right, 20/20; Left, 20/50. Total occlusion was, a this time, instituted and continued for six months when the vision became 20/20 in each eye. Orthoptic training was then instituted and a fair degree of fusion developed but with a deviation of approximately 15 degrees for distance and 30 degrees for near. Surgical correction should, at this time, have been instituted, yet, in spite of the deviation, the vision has remained normal for the last year and a half and should, at this time, be well established.

Case 6.—J. E. S. had had a convergent strabismus practically since birth with reduced vision in the left eye treated by occlusion and orthoptic training. Treatment was first instituted at three years, was continued for the next two years at which time the vision became normal in either eye with a deviation of approximately 15-20 degrees convergent strabismus and constant fixation of the right eye. At this time recession of the left internal rectus and resection of the left external rectus and continued orthoptic treatments produced binocular fixation and normal vision. It is doubtful if the fixation could have been maintained without surgical correction because of the marked contraction of the left external rectus.

There are several factors which should be stressed. Occlusion when used should be total. Part time occlusion is of little value. Frequent examinations to determine the vision of both eyes is imperative. When normal vision has been acquired, yet fixation does not occur spontaneously, such lack of fixation may be due to muscular contraction of the internal rectus. It requires more nervous energy to fix with a squinting than a non-squinting eye due to structural changes in the muscles. Consequently, surgical correction of the anatomical changes are necessary to help maintain fixation.

The operation of recession or retroplacement of a contracted muscle and subsequent resuturing of this muscle to the eyeball and the routine use of intratracheal general anesthesia have greatly improved operative results.

CONTRAINDICATIONS TO ESTROGEN THERAPY

Malignant growths of the mammary gland and the uterus have been induced in rodents with estrogens by numerous investigators. Some physicians, however, have doubted that the therapeutic administration of estrogens in the human being could result in the development of similar malignant growths. It has been pointed out that, theoretically, tremendous dosages of estrogens might be required to induce human cancer, when calculated according to body weight. No doubt estrogens have been used intensively for relatively too short a time to warrant the conclusion that mere absence of reports from the literature justified a disregard for the possible consequences of estrogenic therapy. Recently two significant reports have appeared which should indicate the possible dangers of administration of estrogens; one reports a case of mammary cancer following prolonged use of estrogens, and the other reports the appearance of carcinoma of the cervix in three patients among forty-three who were treated with estrogens for kraurosis vulvæ and senile vaginitis. The Council on Pharmacy and Chemistry and THE JOURNAL have repeatedly warned against the indiscriminate and prolonged use of estrogens and have emphasized the possible occurrence of mammary carcinoma in patients who are susceptible to the development of such malignant growths. It would be unwise to consider that there is safety in using small doses of estrogens, since it is quite possible that the same harm may be obtained through the use of small doses of estrogen if they are maintained over a long period. While there appears little or no evidence to indicate that normal women may develop such malignant growths, it would be well for the physician to realize that this is by no means an impossibility in patients who have a personal or familial history of genital or mammary cancer. It has been reported that the new synthetic estrogen diethylstilbestrol is far more active than the natural estrone and estradiol in the production of uterine and extra-uterine fibroids in guinea pigs. There is no evidence, however, that it is more carcinogenic than these substances. (Jour. A.M.A., April 20, 1940, p. 1560.)

THE COMMON BEHAVIOR PROBLEMS ENCOUNTERED IN THE PRE-SCHOOL PERIOD*

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CHILD psychiatry is a recent development in the sphere of medical sciences. It came into being with the professed goal of attempting to prevent the high incidence of mental deviation encountered in the adult years. It is generally accepted that the onset of mental disease is seldom sudden, but is a gradual accumulation of maladjustment that can frequently be traced back into early childhood.

The problems of the pre-school age are important, for during these brief years the fundamental patterns of meeting life's situations are laid down. As our understanding of psychiatric problems broadens, this period acquires greater significance. If we are to be successful in the campaign of prevention of mental disorders, it cannot be overlooked.

Until recently, illness in children was regarded as part of general medicine. The same procedures that were followed with adults were considered appropriate in modified form for the child. It is a short half-century since the branch of pediatrics became a separate entity. Its early years were devoted to the evolution of scientific infant feeding, the management of the acute infections and the care of the chronically ill. Modern methods, the advances made in bacteriology, more accurate means of diagnosis and effective specific treatment aids have entirely altered the type of problem that confronts the pediatrist of today. There is now time for him to direct attention to the consideration of each patient as an individual and to evaluate his needs. The recent report of the American Board of Pediatrics, published in the *American Journal of Pediatrics* of February, 1940, outlines a course of study in child psychiatry the Board feels would be of practical benefit to pediatricians. This is concrete evidence of the recognition of the importance of emotional problems in the sick child.

Child psychiatry is a more recent development than pediatrics. In America, the first children's clinic was established in Chicago in 1909 by Dr. William Healy, the present director of the Judge Baker Guidance Center in Boston. From this early Chicago clinic great things have grown. Our guest speaker this afternoon, Dr. Paul Schroeder, the present director of the Institute for Juvenile Research, today carries on the work of the original clinic established by Dr. Healy. The credit for much of this development belongs to the Commonwealth Fund and the National Committee for Mental Hygiene, which so generously jointly sponsored the demonstration child guidance clinics. The Rockefeller Foundation also has given financial support to this activity. This type of service is past the experimental stage. From the single clinic in 1909 and the half dozen of 1920 there are today approximately 500 child guidance clinics spread across this country.

Until recently there was but a fragile bond of interest between the pediatrist and the psychiatrist interested in children. Each felt that the other's territory held little interest for him. Few understood the jargon of the other, as each attempted to separate the child into his physical and mental sections. The pediatrist recognized that the child had a mind, but thought it was of little importance in his treatment plan. Often a blank wall of resistance was raised by the pediatrist toward the psychiatrist. On several occasions in my early days in this work I was invited to speak at pediatrics meetings and found many of the pediatrists departed before I started. They felt that a psychiatrist was bound to confine his remarks solely to sex conflicts in infants and were not interested. Usually the same few friends stayed to listen because they had found, several of them through the medium of their own children, that perhaps some useful comments might be offered.

The reception at the psychiatric meetings was not much more cordial than that received from the pediatrists. Ten years ago, at the American Psychiatric Meeting in Toronto, I was invited to read a paper entitled "Psychiatry in the Pe-

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diatric Department of a General Hospital." This study was based on four years' work at the Strong Memorial Hospital at Rochester, New York, where Dr. McQuarrie, the present professor of pediatrics at the University of Minnesota, and myself both were on the staff and had worked in close coöperation on our common problems. The psychiatrists interested in child guidance at that Toronto meeting neatly dissected the paper, in which was made the premature statement that " the psychiatrist had temporarily assumed the sponsorship of work with children for the pediatrician with the aim of ultimately returning it to him." The attitude was that the two fields were and should be strictly delineated. I disagreed with the point of view, for it was felt that this was the weak spot in the development. I continued with my plan of coöperation and am pleased to see a gradual capitulation of both pediatrists and psychiatrists.

Our work at the Psychiatric Clinic for Children at the University Hospital and earlier in the clinic at the University of Rochester has indicated the necessity for a close bond between these two fields of children's work. It should be fully recognized that the psychiatrist has no desire to supplant the pediatrician, but strives to complement him. The latter, however, should be trained to be alert for the emotional components that occur in sick children. Once he has become aware of their presence he can plan a course of action toward their elimination. He will find that the majority, if recognized early and managed sympathetically, will disappear. This is the truly preventive work of mental hygiene.

Where the problem is already well established and the environmental factors so formidable that treatment procedure is complicated and time-consuming, it becomes impractical for the pediatrist to attempt to carry it out. Reference to the psychiatrist is then indicated. The special facilities of the child guidance clinic can be marshalled effectively to deal with complicated situations. Here each problem is approached from the angles of physical health, intellectual and emotional endowment and environment. In a high percentage of problems referred to us for study, not only in the pre-school group but also in older children, the difficulty originates with the adults who surround the child rather than with the child himself.

Those of pre-school age coming to the hospital psychiatric clinic present predominantly physical problems that have led to reference for study. The most common problems of this group center about feeding difficulties. Probably the clearest picture of them can be given by briefly presenting a few typical cases.

Case 1.—J. C., aged twenty months, was referred to hospital by the family physician with a history of regurgitation of ten months' duration and a tentative diagnosis of pyloric stenosis. Every approach had been tried by the family physician without success. Various modifications of diets had been attempted, and at the time of reference the child was on twelve hourly feedings per day. These she regurgitated regularly. When making the hospital arrangements over long-distance phone, the family physician outlined the history and added, "The parents are a pair of old maids. The father is as bad as the mother. They never should have had a child. They will run you ragged." Obviously the physician displayed a strong emotional reaction against them.

J. was a bright, well-nourished child in spite of her history of regurgitation. Complete physical study revealed no pathology except an exceptionally irritable gastro-intestinal tract that would indulge in active retro-peristalsis with minimal stimulation. J.'s most expressive remark was, "I'm going to be sick," after which she usually was.

J. was the only child of parents in their late forties. They had been engaged twelve years before marriage. The father, a prosperous village business man, had been dominated all his life by his mother, who disapproved of his contemplated marriage. He was neurotic and a patent medicine addict for many vague complaints. He felt guilty that his poor health was responsible for the misfortunes of his child. The mother, who throughout the long engagement had taught school, was an intelligent, but frustrated, woman. She had equal guilt fears that the long delay in pregnancy, coming near the menopause, was responsible for the difficulty. Both parents knew that this would be their only child. Consequently they were apprehensive over her survival. The mother had given her undivided attention since birth, and the preceding year during the child's illness had not left her for a moment. It was only fear in both parents that had induced them to bring her to the hospital. The mother sought admission for herself so that she could be near the child.

In the hospital the child was whiny and expected to be the center of attention. She was early placed on a regular diet suited to her needs. If she lost a meal, nothing was forthcoming until the next meal. At first she resented the other children as she had never been close to others before. Later she became interested. After ten days in the hospital she was brought into the nursery school group for play periods. Her first reaction was to demand every toy from other children, going from one to another. When refused her reac-

tion was, "Give it to me. I'm going to be sick." One three-year-old boy refused to give in and upon J.'s threat of illness called to the rest of the group to watch J. be sick. When requested thus to demonstrate, J.'s ability for once failed. This incident marked the beginning of a new era of constructive education. Contact with children accomplished what adults had failed to do. The regurgitation had no more serious basis than a pair of over-solicitous parents and a poorly directed medical program that ignored emotional tension in both parents and child. Our treatment capitalized the reassurance of the parents, the removal of many of their frustrations, demonstrating to them that their child could be a normal youngster. The outcome was good as the parents both developed understanding and outside interests that gave them other things to think about.

Case 2. A second variety of feeding disturbance is represented by R. L., a three-year-old daughter of a physician. The mother before marriage had been a graduate nurse. R. from an early age had many allergic reactions such as to milk, wheat flour and many of the common foodstuffs. In addition, infections increased her anaphylaxis. She twice had pneumonia in addition to double mastoidectomy. She was frail, underweight and high strung, and being intelligent had learned to dominate the family by refusal to eat. Both parents were aware of the narrow margin of safety and became unduly apprehensive when she refused food. Mealtime became a daily battleground of coaxing, wheedling, and promising. The parents realized their approach was wrong, but admitted that she had them beaten. They asked that she be admitted for study and training. R. was an old friend in hospital, where she had often been during serious illnesses. This time she was ambulatory and after preliminary study came to nursery school each day from the hospital ward. The first meal she was placed with other children, under the existing rule that none could leave the table till all had finished. R. toyed with her food while the others waited. The span of patience of three-year-olds is short. Restlessness grew intense. Finally a boy said, "Tomorrow you put R. at another table. We don't want her with us. She is too slow and spoils our fun. We want time to play." This was her first encounter with disapproval. Coming from a contemporary it carried weight. The next day no one wanted her at their table because of her slowness. She made some effort to coöperate and finished a small serving in acceptable time. Each day her plate was filled a little fuller until she was consuming an adequate amount. For weeks after discharge to her home from the hospital she got along on one full meal a day. She would eat heartily in nursery school, but usually refused breakfast and supper. As the parents acquired reassurance, they began to ignore her and made little effort to persuade her to eat. On one occasion they suggested that as R. probably could not eat all her portion, she might share it with her brother. R. left none to be shared. As casualness and a sense of security grew in the parents, R.'s efforts to dominate decreased. It was encouraging that with the diminution of tension there was an accompanying lowering of allergic response.

Feeding problems frequently originate after serious illness, but persist long after the convalescence has ended. The mechanism of production is easy to understand, but the reason for perpetuation is not always so apparent. The explanation can usually be found in parental attitude toward food. Over-emphasis defeats the purpose if the child learns he can gain attention by refusal to eat.

The elimination of a feeding problem is important. It may be the starting point of a gastrointestinal neurosis, so common in adult years, that has progressively passed through the stages of food fads and idiosyncrasies to more exaggerated manifestations.

Once the physician has completely ruled out the possibility of an organic basis for refusal of food the task is only partially complete. The reeducation of parental attitudes is equally important. The frequency with which these children reach the clinic indicates that the correction of a feeding problem is not always easy. Reeducation is often time-consuming. Occasionally it becomes a formidable task, involving the reorganization of many fundamental principles in the lives of both parents that exert unfavorable influence on the offspring. It is time well spent, for the persistence of these traits will produce undesirable reactions in different forms at a later date.

Temper tantrums and fears rank second and third in order of incidence of referral to the clinic. We suspect that in actual occurrence these are more frequent than the feeding problems. They do not reach the clinic because they do not represent a comparable threat to survival. The parent expects that it is a transitory inconvenient phase that will be outgrown. Like the feeding problems, the persistence of these reactions should be cause for concern, for when they are perpetuated into the adolescent and adult life, they often become major handicaps to success. Again it is essential that the physical status of the child be thoroughly investigated. In the absence of pathology, attention should be directed toward an investigation of the system of management. It is easy for these patterns to become established in a child below normal physically.

The threshold of fatigue and sensitivity is lowered, tension is increased, impressibility is heightened and misbehavior results.

In a child who is well the incidence of tantrums and fear become symptoms of ineffectual management. The busy practitioner is prone to consider the treatment of tantrums and fears beneath his dignity, beyond the superficial suggestions of isolation and ignoring the tantrum or reassurance in the case of fear. The true explanation often lies much deeper and must be considered if sound foundation for satisfactory future development is to be laid. Malignant parental attitudes toward the child may first attract attention through outbursts of temper in the child. Parental rejection may influence the system of training, against which, as a result of frustration, the child expresses himself explosively. Careful analysis of the situation that eliminates the source of friction may prevent more serious developments at a later period. Veiled antagonism by a parent toward his child may produce many other types of reaction besides tantrums and fears. We have seen many children whose response was: (1) wilful destructiveness; (2) aggression toward other children; (3) neurotic punishing reactions such as thumb sucking, facial tics and habit spasms, reversion to enuresis and soiling after satisfactory toilet habits have been established; (4) refusal to talk or reversion to baby talk. Reactions of this type may exist as single entities or in multiples. Little success can be expected from treatment if the emphasis is directed solely toward the child. Correction of the faulty parental attitude toward the child is essential if any permanent change is to be expected.

A typical response is demonstrated in the following case:

Mary L., four and a half years old, an only child, was referred for study by the family physician because of poor muscular coördination, lethargy, and flabbiness of muscles. The local doctor could find no evidence of organic disease but feared the onset of a progressive muscular dystrophy. Careful physical study revealed no definite reason for the condition although coördination was poor, she frequently tumbled, and all her movements were clumsy. Birth and health history were essentially normal.

The family background was important in that the parents had separated soon after Mary's birth. The father was an intelligent, but thoroughly impractical individual, with little sense of responsibility. After the separation he had drifted out of the picture. He made one feeble effort at reconciliation, which the maternal grandmother violently opposed. The mother had returned to live with the maternal grandmother. The latter had violently opposed the marriage and had grim satisfaction that it had not been successful, a matter in which she played no small part. The mother had not wanted the pregnancy, feared it throughout its duration and fear of further pregnancy featured in the separation. There was bitter resentment toward her husband, which carried over unconsciously to his child. This was camouflaged in seemingly genuine, conventional protest of anxiety. Mary strongly resembled the father in appearance. She was a rather plain child. The mother had pictured her daughter as a story book, doll-like creature. Mary's lethargy and clumsiness were further sources of irritation. The grandmother was convinced the child was feebleminded and constantly reiterated her opinion to the mother. The result was that the child was emotionally starved, and although given excellent physical care, was generally ignored. Long hours in a play pen without adequate opportunity for exercise or the stimulation of companions had removed all incentive toward activity. She was content to sit for long periods and look at pictures in books. She seldom talked or cried.

Mary was a pathetic youngster, who stood all the physical examinations stoically and impassively. She seemed entirely detached. On psychological examination she showed superior ability. The test was uneven because of her passivity. After physical study had revealed no basis for anxiety over her physical condition, she was seen regularly in the clinic. After considerable stimulation a brief spark of spontaneity could be aroused. It appeared as if she feared to enjoy herself. On one occasion in the playroom she made a feeble imitation of another child throwing a ball. It unfortunately hit a window, and although nothing happened, she could not be induced to touch another toy. The unhealthy emotional attitude that surrounds this child is largely responsible for the lack of development. Treatment has not been successful, for it has meant fighting the malign influence of the grandmother at each step. She does not want the child to be normal. The mother has been in a difficult situation because she does not dare defy the grandmother. Salvage was attempted by means of nursery school and a short period at camp. Attendance at nursery school was irregular, as the mother was willing to resort to any subterfuge to keep the child home. The period at camp was not long enough to accomplish much although Mary learned to dress herself. She took part in the games and seemed happy although aloof from the group. The grandmother is still convinced the child is subnormal. The mother retains her ambivalence and Mary continues to develop slowly. The tragedy is that there is nothing anyone can do to alter the situation.

The aim of the pediatrist should be directed not only toward the development of physically healthy children, but also toward the development

of mentally sound and well-adjusted individuals capable of functioning at the full level of capacity. It is his responsibility to see that the first steps toward emancipation from the home are taken early. These are often delayed until the child reaches school age. The poor preparation for group activity which is inevitable at this time may easily give rise to feelings of inferiority that impair good social contacts. Stress should be placed on the early acquisition of self-reliance and independence, for these are necessary attributes to a well-adjusted personality. Handicapping parental attitudes toward the child should be recognized and altered before they can wreak devastation.

As refinements of diagnosis and treatment methods have been developed in the realm of physical illness, the physician should have more urge to devote time to the study of the individual child as a human being in relation to his surroundings. If we are to advance in our program of prevention against mental illness, the start must be an active one during the pre-school years. Pediatricians and family physicians must feel more responsibility in assuming a broader understanding that emotional health is as important as physical health. To ensure good mental health the investigation must go more deeply than the consideration of the child alone, but often must extend to the reconstruction of attitudes of those who surround him.

When firmly established problems are encountered where the ramifications are so widespread that reconstruction becomes too time-consuming, the psychiatrist and the guidance clinic are prepared to assume re-education for the physician in practice. In this way the one branch of medicine supplements the other. If better mutual understanding of both fields is created, a much sounder and more productive order of prevention of mental illness, which today exacts such a tremendous toll from society, will result.

MENTAL HYGIENE IN THE SCHOOL*

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THE public school offers an exceptional opportunity for public health work. While the physical health program with its required medical examinations and inspections, Mantoux testing and health education is better known and better developed at the present time than the program for securing better mental health among the pupils, it cannot hope to contribute as much to human welfare. In this paper I intend to present those major objectives of mental hygiene which are related to the school life of the child. These objectives may not seem very new or very dramatic; but they are sound and have been proved empirically in clinical psychiatric practice a thousand times over.

It is very difficult to say anything new about human nature. One of the great assets of mental activity is its ability to guess at things and often guess correctly. People have guessed and guessed about human nature, and have hit upon almost every possible theory to explain behavior. The undramatic task of scientific psychiatry is to discover what is true, and it is usually found that somebody's lucky guess has anticipated its results. The biggest contribution of psychiatric investigation is not in the novelty of its findings, but that it offers a safer basis for human progress than the flashy guessing of the amateur who, in the words of Artemas Ward, "knows so much that ain't so." It is usually "the stuff that ain't so" that makes newspaper headlines as scientific material about human nature today. It is sufficiently absurd not to disturb anyone's psychological defenses. Valid observations are usually "old stuff" if they are not offensive—which is to say, if they do not attack our defenses against our repressions.

If a scientific observation of psychiatry does attack our psychological defenses, it is usually counter-attacked by a motley group rang-

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ing from the most poorly educated charwomen to the most successful and best publicized scientists who can be scientific about everything but their own private lives. This paper, let me hasten to assure you, should not attack your defenses. But to get into our subject—

Mental health has been defined by the White House Conference as "the adjustment of individuals to themselves and the world-at-large with a maximum of effectiveness, satisfaction, cheerfulness, and socially considerate behavior, and the ability to face and accept the realities." Defined in another and more negative way, mental health work seeks to reduce the occurrence of mental disease, personality handicaps, feeblemindedness and delinquency. All of these latter conditions represent failures in the adjustment of the individual to life, and constitute a major problem in our civilization.

Each year there are as many first admissions to mental hospitals as there are students matriculating in our Universities. Five per cent of all fifteen-year-old children will develop such a serious mental illness sometime during their lives that they will be forced to enter a mental hospital. In addition to these severely maladjusted people who occupy more than half of all hospital beds, there is a much greater number whose lives are detrimentally affected to a lesser degree by minor mental illness such as neurosis, or by personality handicaps such as inferiority feelings, self-consciousness, moodiness, sensitivity, irritability and the like. This latter group may be likened to sufferers from arthritis whose efficiency and happiness in living is materially reduced, although they are not denied the appearance of normal health.

A mental hygiene program in a school system works to reduce the number and severity of these handicaps as they develop in school children, and furthermore attempts to bring about a situation in schools that will promote better mental health in all pupils. At the present time, this goal is sought through the discovery, and elimination or reduction, in the obstacles to mental health that arise within the school system itself. Quite a number of these obstacles that warp children's personalities and tend toward the production of maladjustment, mental illness or delinquency have been discovered, and constant progress is being made in their removal.

School Failure Forced Upon the Dull

What are some of these obstacles or sources of infection, as they might be called by analogy? The first and perhaps the best recognized factor that attacks mental health in the school is the impossibility for the duller children to win success, no matter how hard they try. There are perhaps ten to fifteen per cent of the school population who are innately lacking in intelligence or school ability to such a degree that they are denied the opportunity to do a satisfactory job. This, of course, produces frustration and a feeling of inadequacy which is unhealthy. Nature's defenses begin to work then in these children, and compensations are sought for this need which is unfulfilled. Some children may be fortunate enough to have assets in physique or special abilities, etc., so that they can compensate in a way which is not harmful. Others, however, possessed of no such equipment, may find compensation in retaliatory, bad-boy behavior or through withdrawal into phantasies of success and the like, and the basis for further maladjustment or mental illness is laid.

Child Guidance Clinics can show case after case of personality maladjustment that went to extreme degrees with this factor of the impossibility of winning success and approval in academic work as the sole or coöperating etiological agent. This particular obstacle to mental health arises out of the fact that it takes a full six-year mental age to handle first grade work, a seven-year mental age to handle second grade work, etc. A child with an I.Q. of 80 for example, is not mentally up to the average six-year-old until *he* is eight years old. He simply can't do first grade work in a satisfactory way until he has spent two years more in developing his ability than the average child takes to reach that point. If he enters school when he is six, failure is forced upon him in spite of his best efforts to keep up with his age group. In the past, he has either been held back and forced to repeat the grade, or sent on to the next higher grade where he found daily failure in his assigned tasks facing him again.

The only way that this obstacle to mental health may be reduced is to teach the child in school what he is able to learn—no more and no less. It is perfectly possible for teachers to know in the present day what school ability a child pos-

sesses. The individual intelligence tests have proved themselves to be beyond doubt a very reliable measure of academic ability. School administrators and boards can make these measurements available to teachers on all pupils so that, knowing what the child is capable of learning and what he is not capable of learning, the teacher can adjust her teaching to his level of ability and avoid the mentally unhealthy result of requiring work that can't be done. This, of course, means that the teacher must individualize her work in the classroom, and that can't be done unless the size of the class is smaller than when the group is treated as though it is homogeneous in the matter of school ability. This adjustment to the needs and capacities of the individual children is being made in an increasingly large measure throughout the country, and it is largely due to the mental hygiene emphasis upon this point as a fundamental necessity in securing better mental health for pupils.

Poor Work Habits Resulting From Brightness

A second factor in the school producing maladjustment and personality distortion is closely related to the first. It is the lack of challenge and interest that results when a child much brighter than the average is given tasks too easy for him. Habits of indolence and lethargy and a feeling of false superiority may be produced which handicap the child throughout the rest of his life. Good work habits are of tremendous importance in determining a person's success in later life, and frustration and failure in meeting expectations are often the lot of the adults who were allowed to "get by" too easily in their school years because of superior intelligence. The remedy that is recommended and is being put into application slowly in schools to correct this obstacle to mental health is the same as in the case of the adjustment to duller children. In this case, of course, the pupil being *more* capable is given work of a more difficult grade—work that is challenging and interesting.

Effects of Specific Reading Disabilities

A third obstacle to mental health found in our schools arises out of the fact that reading and writing are such important tool subjects that everything else depends on the ability to master them. Now some children, though otherwise intelligent, suffer from a specific disability in learning to use written language. We all recognize readily that an intelligent person may be tone deaf and find it impossible to recognize or sing a tune correctly. That represents a specific disability in music. People so handicapped are not bothered much by it because it is possible to avoid singing without dire consequences. Not so in the case of those individuals who can't learn to read or spell with ordinary proficiency, however. Such cases were first described by Kussmaul in 1877, and he called them "word blindness." Hinshelwood, a English ophthalmologist, gave us the first intensive study of the condition in a monograph published in 1917. Many children had been referred to him because it was thought that their inability to read was due to some disorder in vision. This did not prove to be the case, but Hinshelwood called attention to the fact that there were often several such cases in one family, and that the symptoms these children showed were closely parallel to those which appear in some adults who have lost the capacity to read through an injury to the brain. He thought the condition might be due to an agenesis in the angular gyrus (speech area) of the dominant hemisphere. Evidence from autopsies has not supported this theory. Samuel Orton at New York Neurological Institute has done a great deal of work with this condition, and has named it strephosymbolia, meaning "twisted symbols." One of the prominent diagnostic features of these cases is that they make many reversals and inversions of letters and syllables in reading and writing. "Dog" is read "God" and "on" is read "no," but such errors are not made consistently by the child so that a word may be read correctly once and reversed the next time it is met a line or two down the page. The letters *b, d, p* and *q* are usually very badly confused due to their similarity. These children may be so severely handicapped that they are still unable to learn to read even the simplest material after years of schooling. One eleven-year-old boy with superior intelligence whom I saw could not read a single word, and could recognize only a few of the letters of the alphabet. Others are not so severely handicapped, and may be able to read and write with great difficulty and always make a large number of errors. About two per cent of our school children are so seriously affected by specific reading disabilities that they can make only the most

meager progress in school work. The disability seems to be related in many cases to speech defects and to shifts in handedness from one side to the other.

The personalities of these children usually become seriously distorted because they are so often taken to be feebleminded. They even seriously question their own intelligence. If their intelligence is recognized, they are then thought to be stubborn by their teachers and parents, and under the pressure that is put on them to learn to read often grow to justify the characterization. All forms of compensatory behavior show up in these children. Their relationships to their teachers, companions, and even parents is oftentimes deleteriously affected by their school failure and very undesirable personalities may result.

From the standpoint of school mental hygiene, an adjustment must be made to these children. Fortunately, it is possible to teach most of these children to read and spell satisfactorily if they can be given individual instruction by a patient, kind person who will try out all the techniques that can be used to teach reading until she finds out what will work for this particular child. The more progressive school systems are employing such tutors and also training some of the teachers in lower grades to use a wider variety of teaching techniques while avoiding a degree of pressure that develops an antipathy to the subject in the pupil.

Teachers' Personalities

A fourth obstacle to mental health in the school is often found in the personality of the teacher. Several careful studies have shown the greater percentage of personality and behavior problems that appear in the classrooms of embittered, harsh, cold, perfectionistic, sadistic or pedantic teachers. Parents who are good observers can usually notice the changes that show up in their own children's personalities as they move along from one teacher's influence to another. Teachers who, out of some personality quirk of their own, require the pupils to maintain a "pin-drop discipline" and to behave in such utterly unchildlike ways—ways which are inappropriate to any other contemporary or future situation—do a considerable amount of harm to children's personalities and should not be allowed to go on with their methods.

One should not be too harsh, however, in condemning the teachers for unfortunate personalities, because the narrow way in which they are required to live by the parents and community as a whole is so unrealistic and unhygienic that it, in effect, forces them to develop unhealthy qualities. The sanctimonious behavior that is required of them, the deprivation of the right to marry and still hold their jobs, the inadequate salaries many of them have to exist on, all foster suppression and frustration and personality distortion. Such regulations and super-moralistic requirements made upon school teachers tend to keep out of the profession many normal, warm, vital personalities and tend to produce maladjustment in those who remain in the work. This has its undesirable consequences in the pupils' personality development.

A thoroughgoing effort to solve this problem of securing teachers with normal personalities and keeping them that way can hardly be said to exist any place in the country today. Teachers are still being selected very much in terms of their academic records alone with no consideration given to the effect their personalities will have on the pupils' mental health

In closing, I should like to impress upon you again that these problems of which I speak are *health* problems. They have had all too scant attention from physicians who are otherwise interested in promotion of health and disease prevention. There is nothing vague or abstract about these obstacles to mental health. It may be that the average physician's dislike for personality problems, which probably arises out of his feeling of unfamiliarity in this province of medicine, has prevented him from finding the causes for the behavior disturbances he sees in his practice. Work such as is being done in the child guidance and other psychiatric clinics throughout the country is clearing up a good many of the mysteries of personality distortion and bringing order into a field which at one time was completely chaotic. The obstacles described briefly in this paper are matters about which there is general agreement among child psychiatrists and progressive educators. How many of them are still operating in your community to cut down the chance for mental health of the young people growing up there? How long will it be before the physician recognizes his responsibility to contribute to the elimination of these health hazards in our schools?

EMOTIONAL FACTORS IN ORGANIC DISEASE*

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THE doctor's first interest has been the cure of the sick. He has been most concerned with those critically ill. Because of this, his patients have been those who suffered with the more grossly pathological conditions and who therefore deviate most from the normal. The modern doctor is also interested in the prevention of disease. As his understanding of the well person has grown, he has become increasingly more concerned with preventive medicine.

This is the experience of the doctor in the diagnosis and treatment of organic diseases. In the treatment of functional diseases much the same progression has occurred. At first only the obviously insane were considered the province of the physician. As his knowledge of those with grossly abnormal behavior grew, he found that often the underlying causes of these diseases were found to have their beginning in childhood. Accordingly in time the physician extended his practice to the treatment of the less seriously mentally ill to include as well children with emotional disturbances.

Although the physician in the past has been concerned with the psychic disturbances which occur in the presence of organic disease, he has relegated them to comparative unimportance. In his study of the patient, he drew a definite line separating the mental and the physical findings. Failing to find evidence of organic disturbance, he dismissed the patient with the statement that his symptoms were a figment of his imagination. Having made such a diagnosis, his interest and concern ceased. However, the concern over the patient continued in another sphere, a sphere which, though largely legalistic, was actually the concern of the social worker. It was represented in the asylums for the insane.

The first real understanding of the illnesses of these patients followed the sociological contribution of Clifford Beers in his own story, "A Mind that Found Itself." This is the story of his experiences as a patient in the general hospital, later the private hospital for the mentally ill, and finally the state hospital for the insane and contains his recommendations for reform in the cure of the mentally ill. His indefatigable efforts in behalf of the mentally ill changed the point of view of the physician as well as the administrator. It was about this same time that Sigmund Freud made his early contribution to the understanding of the psyche.

From still another field there was evidence of the shift from the desire for vengeance to control of crime through a therapeutic device. This was represented in the program of probation and parole, the first of which went into effect nearly one hundred years ago.

About this same time, there were evidences in other fields of a changing attitude toward the misconduct of persons who presumably were without organic disease. I refer to the change from the determinate to the indeterminate sentence for the adult criminal. Such changes suggest that the community has come to be more interested in the offender than in the offense.

From still another direction came an approach to the problem in behalf of delinquent and criminal children. It was in 1899 in Chicago that the first Juvenile Court was established. The so-called sentimentalists' point of view held that delinquency and criminality in children were symptomatic rather than inherent and that the conditions which were reacted to with delinquency were remediable. In its philosophy there was the principle that punishment to be effective must be administered as treatment directed towards the correction of the causes underlying delinquency.

We may consider, then, five separate efforts for the better understanding of conduct disorders in human beings, the first of these being a continuation of the progress of scientific medicine; the second, the combined efforts of medicine and sociology in behalf of the insane; the third, the practice of probation and parole of criminal offenders; the fourth, the institution of the principle of indeterminate sentences; and the fifth, the Juvenile Court, and behavior clinic with its combined medical, psychological and sociological ap-

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proach to the understanding of behavior difficulties in children.

Although a generation ago, scientific medicine did not concern itself with the gross disorders of conduct, the last twenty years of medicine have brought a great change in this direction. However, in spite of this, the physician still rejects as a problem of some other worker, the person whose symptoms cannot be explained as of organic basis. A significant change in this attitude is expressed by Barrow in his lectures published under the title, "The Patient and the Art of Living—An Approach to Psychosomatic Medicine."[1] Barrow has given to the student of medicine his approach to the patient and defines psychosomatic disease as follows:

"A condition in which the chief complaint is usually physical, the subjective symptoms are usually out of all proportion to the physical findings, and there is always an underlying and often obscure mental or psychic disorder based on a constitutional inadequacy and on some environmental or circumstantial conflict."[1]

To illustrate the importance of dealing with the patient's problems as a whole, he quotes from the record of a patient examined by a psychiatrist.

"The patient had been told that she was a Peter Pan type of individual, that she would have been all right if she could have remained a child and that it was a mistake for her to have assumed the strain and obligations of married life and motherhood. 'Well,' she said, 'That may be true, but what am I going to do about it now? I still have headaches.' "[1]

Dr. Barrow adds:

"I do not wish to minimize the help that may be rendered by psychiatric consultation and advice but what is needed in the attending physician is not a highly specialized knowledge of psychiatry or of any other of the specialties but rather a breadth of medical vision and skill that will enable him to make the patient comfortable. In addition he must have a large fund of patience and compassion and common sense so that he can establish contact with the patient and win his confidence. The proper approach to these cases might, therefore, be said to be one-third psychiatric, one-third physical and one-third compassionate guidance in the Art of Living."[1]

Barrow reports the findings in a series of 250 patients whom he classified as psychoneurotic persons. In his series, 37 per cent complained primarily of gastro-intestinal disturbances. Second in frequency are cardiovascular symptoms, this being the primary complaint in 17 per cent. Then follows malaise and fatigability 14 per cent; aches and pains, 10 per cent; menopausal symptoms, 7 per cent; sore and aching throat, 5 per cent; arthritis, 4 per cent; genito-urinary, 3 per cent. He also includes neurogenic fever, a low grade fever for which no organic cause is determined. He suggests that in spite of the anxiety of the physician, the desire "to follow the daily temperature curve as a stock broker might follow the ticker tape, it is usually advisable to have the patient throw away his thermometer and forget his fever."[1]

In discussing anxiety states and depressive neuroses which account for about 40 per cent of the male cases, Barrow states that without psychiatric study it is seldom possible to find a cause.

"The anxiety state may often be traced to childhood environment or experiences, even to anxieties never consciously experienced; but the emotional state has been 'displaced' from the original object and transferred to other objects, or anxiety has in fact become a habit of thought. Thus, for example, the child whose tranquillity and security have been threatened by marital discord of the parents grows up into a person surrounded with thick banks of gloom who, although he recognizes that he is no longer dependent on his parents for happiness and security, still approaches each new episode of life with fear. To treat these individuals properly, one must completely rebuild the personality, a task calling for a skilful psychiatrist."[1]

That considerable medical confusion exists over the significance of emotional factors even in the presence of organic disease is in part due to the looseness with which the term psychoneuroses is used, according to Esther Loring Richards.[4] She suggests that there is even some danger in affixing a label to such patients, even though it be a correct one. She writes:

"The term psychoneuroses sounds more modern and scientific than neurasthenia, but from the standpoint of usage and subsequent treatment of the patient it is equally dangerous. First of all, it continues to carry on the medical confusion of a sharp contrast between poor mental health that is supposed to be benign and poor mental health of the outspoken psychoses that are medically recognized as serious enough to call for instant psychiatric help. Secondly, the internist is encouraged by this same old concept to employ essentially one line of treatment for all people whom he considers psychoneurotic."[4]

This danger is also dealt with by Plant in his book "Personality and the Cultural Pattern." He refers to the tendency on the part of physicians to place human beings into certain categories based on an examination which does not include adequate consideration of the cultural background. For example, a patient who is said to be suffering from dementia precox and therefore incurable, acquires thereby an irrevocable future. It is a well known fact that whereas the admissions to the hospitals for the mentally ill reveal an incidence of about 30 per cent of dementia precox, the resident population is nearer two-thirds. In like manner, the child whose intelligence has been tested by a formal method thereby is "given an intelligence quotient" and is to some extent permanently categorized. Until we deal with the meaning that underlies our diagnostic findings, we shall not be able to avoid such dangers.

More recently there has been a growing tendency in the medical schools to teach that the diagnostic procedure must concern itself with the person as a whole and as a part of a larger presence extending into his immediate environment. This is perhaps an extension of the point of view of medical schools generally to teach not only the diagnosis of disease of the various organs but also the reasons for the treatment to be used, a change from the empiricisms of the past. Now we teach the student of medicine that he is treating the person who is sick rather than the disease from which he suffers. In so doing, we are concerned beyond the immediate presence of that person. We may look on our laws regarding quarantine as evidence of this point of view, though of a limited sort. In the course of a newer point of view, larger emphasis is given to the behavior of persons who are ill.

Tremendous and growing interest has been exhibited in the relationship between emotional factors and physical change. Flanders Dunbar has called special attention to these changes in her volume entitled "Emotions and Body Changes." Winfred Overholser, speaking on the rôle of psychiatry in general medicine bears this out in his statement:

"There has been of recent years . . . a tendency of the general practitioner and of the specialist to overlook the whole patient while being preoccupied with certain of his specific parts. Many common examples of the physical manifestation of emotional changes will readily come to your mind. I need refer for example only to the very uncomfortable symptom of blushing on occasions of embarrassment, the presence of goose-flesh and nervous diarrhea in cases of fright, and the various types of physical response to sex stimulation to indicate that it is a common experience and a matter of general knowledge that emotional factors can produce bodily changes. Yet how often this fact is forgotten when a patient comes to the surgeon complaining of enlargement of the thyroid! Investigation has shown that many cases in which the thyroid is evidently putting out an increased amount of secretion are primarily due to emotional conflict and respond promptly to the resolution of those conflicts."[3]

In addition to the growing realization of the significance of emotional factors as the underlying cause of organic conditions such as gastric ulcer and other gastro-intestinal disturbances studies have been made which indicate that essential hypertension and bronchial asthma have large psychic elements in their etiology. French reminds us:

"Since earliest times it has been suspected that psychological factors play some rôle in connection with bronchial asthma. In the last few decades the discovery of the significance of allergic factors in this disease has tended to divert interest away from earlier observations that asthma is frequently associated with some sort of emotional instability and that asthma attacks are often precipitated by acute emotional conflicts."[2]

He reports the results of the psychoanalytic study of twenty-four cases of bronchial asthma. He concludes:

"The asthma attack is precipitated as a rule by a temptation which threatens to estrange the patient from a mother figure. . . . Numerous possible defenses against this conflict would suggest that the common feature in the otherwise divergent personalities of our asthma patients is the fact that the personality of these patients is built up in large part around the task of mastering by one means or another the patient's fear of being separated from the mother. . . . All these observations would suggest that psychological and allergic factors probably stand in a somewhat complementary relationship to each other in the etiology of bronchial asthma, that in some cases asthma attacks may be precipitated by allergic factors alone, in others by emotional factors alone and that in still other cases cooperation of allergic and emotional factors may be necessary to produce the attacks."[2]

To illustrate what asthma may mean to the patient is the following statement:

"There seems also be a very intimate relationship between asthma and crying or laughing. There is

much to suggest in fact that the asthma attack is really a sort of equivalent of a cry of anxiety or rage which has been inhibited or repressed. One of the first reactions of the child upon separation from the mother at birth is to cry and during early infancy and even later, crying remains the predominant reaction of the child in situations of helplessness when he can only wish for the mother to return to him. In later life this primitive cry is modified into speech and in confession retains the function of maintaining the bond between the child and mother. For some reason, in the situations which provoke asthma attacks the child is unable to cry. . . . Of particular interest, however, is the fact that we are sometimes able to observe the cessation of an asthma attack and the appearance of crying in its place."[2]

Perhaps the best illustration of the emotional factors in the presence of organic disease occurs in persons who are left with an obvious physical handicap. Alfred Adler has shown rather clearly the tendency of the human to react to physical limitations in a variety of ways. His theory of the inferiority complex based originally on the emotional conflicts over the presence of a real handicap was later extended in its hypothesis to the reaction to a feeling of inadequacy and inferiority. This has been carried further, calling attention to the fact that inferiority may be only as the condition deviates from the accepted standard. For example, persons with red hair being in the very limited minority deviate from the standard for human beings as a whole. Lipemial persons with blemishes or those having a large nose or even a snub nose appear in a similar category.

William Healy early recognized the extraordinary behavior of children suffering with organic disease. In one of his early reports he describes a child who was brought to the Juvenile Court because of delinquency. This occurred after he had been frightened by confinement in the local police station without avail. This responsible and reliable family was deeply concerned over his stealing and his rather sudden school failure and were greatly disturbed over the necessity for court action. Examination made by Dr. Healy revealed that the child was suffering from juvenile general paralysis of the insane and that his sudden change in personality from an industrious, well behaved, promising school child to one of school failure, truancy and delinquency was a part of the change due to the presence of syphilis. In like manner, behavior difficulties have occurred in children with disabilities of a more obvious nature, but which lend themselves to therapeutic effort. For example, a child brought to us for examination at the request of the judge of the Juvenile Court had been charged by the police with twenty-five burglaries, all of which he admitted. His picture appeared in the newspapers wearing a man's felt hat, a handkerchief tied around his neck and a police revolver in each hand, with the caption "The Baby Bandit of Chicago." He was small in stature, came from a home in which the father was a rather poor provider but honest and reliable. The community in which he lived was classified as one of the middle class residential sections. The patient, though truant from home, had attended classes regularly. The school reported that he was a good student, an excellent reader, and in the fifth grade. There was only one complaint against him and that was that he was sometimes tardy in returning to class after recess. To the parents, his conduct was unbelievable. Examination showed that the patient was well nourished, well developed, with the exception of hypospadias. In response to intelligence tests he was found to be average and therefore properly placed in school. An attempt was made to get him to explain his conduct. To this he replied, "I can't make good. You've got to be a sissy to make good." A number of questions were naturally raised, especially with this comment from a boy who not only was obviously not a sissy but who admitted more criminal acts than he was guilty of. His father stated that until the child was about seven years old, he sat down to urninate. What happened after that time, the father did not know since the child would never permit a second person in the bathroom with him. We did have, however, in this an explanation for his tardiness at recess. Because of the presence of the hypospadias, he identified himself in a rôle which was intolerable to him. His violent reaction to it can be understood as the degree to which he rejected that rôle.

In planning treatment for this child, it became evident that some immediate steps must be taken to effect a change in his attitude toward himself and perhaps this would necessitate removal from the community. Possibility of plastic surgery was considered, but the recommendations were not carried out. Within three months, he was back in the hands of the police, having returned to his former behavior. This

time, the recommendations were ordered by the court to be carried out. In considering the usual indications for surgical intervention in hypospadias, one must consider here also the nature of the interpersonal relationships about to be thrust upon him by virtue of his emerging adolescence.

Let us pass to the consideration of emotional problems in children who are free from organic disease. By way of illustration, I should like to present the following case:

A boy fifteen years of age, living in a middle class residential section of a large city, was arrested by the police for stealing small articles from a department store, including mechanical pencils, rubber balls, and an inexpensive electric clock. Along with two other boys, he was also charged with damaging a number of women's hats as he poured liquid ammonia down an air chute in a store. In still another store, these boys threw stench bombs, one of them setting fire to drapes hanging over a railing.

When the police apprehended them, this boy accepted the major blame. He was placed in the Detention Home pending completion of the investigation.

It was rather surprising that this boy should become delinquent. He was doing excellent work as a sophomore in high school. He is the son of parents, both of whom are physicians, who themselves have strong moral convictions and who served as medical missionaries in China until the older brothers and sisters were ready for higher education.

The father is now president of the Parent-Teacher Association of the school which his children attend. In this family there are three older children in college; a younger sister is in high school. The burden of supporting these children is almost more than the father can afford, even though he has a busy practice of medicine among the people living in his community. Because of these limitations of funds and the rather positive convictions of the parents, the children are set apart somewhat from others. Their status in the neighborhood is seriously affected. The patient's meager allowance was completely withdrawn when the parents discovered he was spending it on candy. He met the situation and the need for status at first by employment in a job delivering papers. This, however, did not last long. Subsequently, he heard from another boy that it was a simple matter to walk into a store and drop articles into a shopping bag. After a time, he began taking things in this manner and sold them for small amounts to other boys in the neighborhood. He justified such actions on the grounds that the store owners were wealthy people who would never miss the few articles he took.

In this boy, of good physical development and health, with fine intellect, with excellent academic adjustment, we observe reactions to profound emotional tension. He is fully aware of the great difficulties which his parents have in meeting the cost of living. He admires his father for his devotion to duty and his mother for her self-sacrifice. He cannot justify taking advantage of their small store of funds. A growing resentment has developed over the family's deprivation, which, by comparison with his neighbors, is great. This resentment is directed towards the well-to-do and expresses itself not only in the small thefts but also in the damage to property and the expression of hostility which is so strikingly effected through the means of the stench bombs.

This child evidently feels set apart from others in the community, in effect has virtually withdrawn from the place which the family holds and which his older brothers and sister are carrying on. Unless his point of view and attitudes towards himself and others are very greatly changed, he may be expected to continue in the direction toward which these delinquencies point. Of greatest importance in therapy is an awareness on his part of the psychological motivation. To this end psychotherapy is indicated.

In summarizing, I should like to repeat that in nearly all organic diseases, important emotional factors exist and that the physician must be concerned with these. He must be concerned with the patient not only as an individual but as a whole being. In the process he must proceed from consideration of the patient into his immediate social contacts. The extent to which he must go will be evident only in his personal relationships. In the treatment of the sick patient, the emphasis must shift from the treatment of the disease to the treatment of the patient.

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TREATMENT OF MENTAL DISORDERS WITH PHARMACOLOGICAL AND ELECTRICAL SHOCK METHODS

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SHOCK therapy is now widely recognized as an effective therapeutic measure in the treatment of certain mental disorders and is being used in one form or another in most of our leading institutions. However, its universal adoption is being retarded because occasional serious complications have been encountered in the more drastic methods which are commonly used. Insulin-hypoglycemic and metrazol-convulsive shock continue to be the most popular methods used, although encouraging results are claimed with picrotoxin, triazol and other pharmacological convulsive-shock therapies. Electrical-convulsive therapy was introduced two years ago with the purpose of avoiding some of the dangers encountered in pharmacological-convulsive treatment. Scores of European and American workers are now investigating its merits, but whether this type of therapy is safer than pharmacological shock treatment remains to be proved. In May, 1939, the writer[3] introduced faradic shock therapy, a safer form of treatment which appears to be producing results paralleling those obtained with the more drastic methods. Shock therapy is not only proving to be a valuable adjunct in the treatment of mental disorders, but it is also giving us important information helpful in clarifying our understanding of the mechanisms involved in various mental disorders.

Shock treatment has been developed empirically, and numerous hypotheses have been propounded in an attempt to explain how it is effective and when it should be used. When insulin shock therapy was first introduced a certain group thought that at last an effective chemical treatment had been discovered and that all of the previous psychological theories could now be discarded. Others argued that relapses were so frequent and the treatment so heroic that it could hardly be recommended unless more striking and lasting results were obtained. Still others continue to maintain an attitude of conservatism because some deaths have been reported and because irreparable damage to the brain has been demonstrated in severe and prolonged attacks of hypoglycemia, either induced or spontaneous. But the great majority of workers who have used pharmacological shock treatment continue to express enthusiasm with their results in spite of its drastic nature.

Disadvantages of Our Present Classification

To understand which types of mental disorders may be most benefited by shock treatment a consideration of our present form of classification is pertinent. In 1896 Kraeplin[25] offered a classification based on symptoms which, with very little modification, is still being used. This classification tends to regard various forms of psychoses as definite entities entailing certain prognoses. According to Meyer[26] Kraeplin himself admitted that the cause of mental disorders was unknown, that the course varied, that the outcome of many cases was uncertain and that no specific lesion was demonstrable. Until the underlying causes of mental illness are better understood, classification must be considered purely tentative and inconclusive. A classification founded upon uncertain premises may be useful in the description of group psychoses, but it is fraught with danger when applied to the individual case.

Freud[14] was the first to show that a close relationship exists between hysteria, the prototype of psychoneuroses, and schizophrenia. Jung[24] drew a striking parallel between dementia precox and hysteria. Pavlov[29] has offered considerable evidence to show that schizophrenia may be regarded as a marked degree of chronic hysteria. Bleuler[6] stated that one can demonstrate a schizoid type of reaction as well as a manic component in every person in extremely varying degrees, and it is simply a question as to which reaction predominates. In this country Meyer and Campbell have been leading exponents in showing the disadvantages of a symptomatological classification, and stress the necessity of regarding mental disorders as merely individual reaction types effected by environment. Meyer[26] points out the need of new and open concepts for practical work, research and the presentation of

the issue to student and laity alike. Campbell[8] says that we should utilize the concept of a schizophrenic reaction type as one accepts an hysterical, or an affective reaction type, as all are precipitated by emotional stress or by failure to meet life situations. The resulting psychoses are merely expressions of certain types of constitutional weaknesses. Constitutional weakness is due in part to inheritance and is also the product of poor life habits. Briefly stated, mental disease represents an exaggeration or a caricature of the individual's personality. The constitutional makeup of the patient prior to the onset of the psychosis has more bearing upon his prognosis than the presenting psychotic symptoms. Thus it is obvious that a symptomatological classification is unsatisfactory, and that a thorough understanding of the individual is necessary if one hopes to treat these patients effectively.

Use of Shock Therapy in the Past

Shock therapy is not a new procedure in the treatment of mental disorders. In the earlier methods unplanned fear and suggestion were apparently the active psychotherapeutic agents employed. It may be quite possible that the ancient practice of trephination was a primitive form of shock therapy. This operation was performed for mental disorders with the belief that "confined spirits" were allowed to escape. It was widely used, for neolithic skulls with discs of bones removed have been found in nearly all parts of the world.[28] Terror and fear as well as suggestion producing profound physiological changes of the nervous system must have prevailed during such operations. Benjamin Rush[31] in 1817 cited many cases of psychoses cured by fear. Deutsch[11] writes of various technics used from 1780 to 1830 to frighten the patient out of his psychosis. In 1828 Burrows[7] recommended that insanity might be cured by provoking fits with the administration of large doses of camphor.

During the past two centuries electricity was popular from time to time in the treatment of mental disorders. In the middle of the nineteenth century the use of electricity became so popular that Huff[21] remarked that mental illness should not be considered incurable until electricity in some one of its forms had been tried. Sir Clifford Allbutt[1] in 1872 made a systematic study of the use of electricity in the treatment of mental disorders. He used a continuous current, applied to the patient's head for ten minutes each day. Evidence of sympathetic nervous system stimulation such as "flushing of the face, giddiness, increased pulse rate and dilatation of the pupils" were noted in most of these patients. He observed marked improvement in acute primary dementia, distinct improvement, but to a less degree, in mania and recent secondary dementia, no change in chronic dementia and "brain wasting," and unfavorable results in hypochondriacal melancholia. Today few claim better results with current forms of shock treatment. Erb[12] discussed the vasomotor effects produced by electricity in an article written in 1883. It is of interest to note that he pointed out that vasomotor disturbances play a dominant part in the development and symptomatology of many forms of psychoses. In 1884 Haynes[19] observed that early functional diseases were benefited by electricity, whereas older and organic conditions showed no response. Blandford[5] in 1886 believed that the encouraging results obtained in mental disorders with electrotherapy were due to "moral" rather than to physical causes.

As a counterpart of the red-hot iron used in the middle ages, the Paquilin cautery has been used within our own generation as a form of shock treatment.[27] This instrument had a hollow platinum point which was kept hot by benzene vapor passing through it. In recent years many new experimental methods of shock treatment have been tried. Various types of induced fever therapies such as malaria, sulfosin and African tick fever have been tried, but results on the whole have been disappointing and inconclusive. Similar experience has been reported with foreign protein shock and leukogenic shock treatment. In the latter method fixation abscesses were produced by cutaneous injections of turpentine.

Janet[23] has regarded these forms of treatment as procedures by moral as well as physical means, or as "treatment by excitation." While admitting that some of these methods may have some merit he warned that exhaustion is a great danger in such therapy. With insulin-hypoglycemic and the various forms of convulsive shock therapies the patient is left in a comatose or unconscious condition whereby extreme apprehension or exhaustion is avoided. When subconvulsive doses of metrazol are given, the patients are left in an

excited and apprehensive state and unsatisfactory results are obtained by this procedure.

Current Theories of Shock Therapy

Although the use of shock treatment is increasing, differences of opinion still exist as to why it is effective. The theories advanced by Sakel have been criticized by Cobb[10] and Gellhorn.[16] A review[32] of Sakel's monograph recently published states, "the clinician will profit from reading the monograph provided he ignores the theoretical and considers only the factual part of the exposition." The theories advanced by Meduna have been attacked by Harris[18] and others.

Gellhorn[16] offered a theory that insulin, metrazol and other drugs used in pharmacological shock therapy benefit the patient by producing anoxia which stimulates the autonomic nervous system in the hypothalamus. Friedman[15] speaks of shock therapy as an irritative therapy which stimulates the central nervous system and breaks up "physiological barriers" to certain associative pathways. Bennet[2] suggested that the effects on depressive conditions are probably due to the efforts of the patient treated to prove to himself his willingness to undergo punishment, with a subsequent resolution of his guilty feeling. Some[22] believe that the shock treatment increases the metabolism in the brain by a sudden rise of the systemic blood pressure. It has been suggested by Querido and Van der Speck[30] that shock treatment does not make patients more social but merely more submissive. Many workers[33] maintain that fear alone is the main effective element. They speak of the patient's fear of the shock treatment as a fear of death or as a "threat of extinction." The frequent observation that psychotic patients temporarily lose their psychotic symptoms or improve when their life is threatened with an acute infectious illness or when subjected to a sudden emotional shock or a major surgical operation supports this theory.

In contradistinction to older medical views that a dichotomy of the mind and body existed, it is now generally agreed that there is a psychosomatic interrelationship between psychological and bodily functions through the medium of the autonomic nervous system. When an individual is unable to face the realities of life, emotional conflicts develop. These conflicts interfere with intricate adjustments necessary in life and the lower and automatic centers of control then assert themselves. Consequently the individual no longer has a harmonious and fully integrated behavior. A vicious circle becomes established and uncontrolled psychic reflexes tend to accentuate and prolong the newly acquired abnormal mental behavior. During the acute stage little can be done by the customary psychotherapeutic approach since the patient is often mute, unwilling or unable to coöperate. After the acute stage passes it is often too late to accomplish much by pleading with reason, for the patient has drifted into a reconstructed world and he is no longer able to cope intelligently with his daily problems. Cannon[9] stresses the futility of trying to argue patients out of their emotional reactions since the cortex has no direct control over the autonomic nervous system. For this reason interviews, explanatory talks and reassurances are usually found to be inadequate.

Gellhorn[16] has pointed out that pharmacological shock treatments act as a powerful stimulation to the autonomic nervous system. This is obviously true also in the different types of electrical shock therapies. Henry[20] says that the autonomic system elaborates the current feeling by a reflex mechanism whether a person is responding to external danger or to internal conflict. According to Singer[34] the presence of a psychosis always indicates a disturbance in this system. Therefore it appears that shock therapy through autonomic stimulation in some way dislodges hallucinations, delusions and other symptoms disturbing to the patient which occur in psychoses. The exact process by which this takes place remains obscure. Probably different factors operate in different cases depending upon the individual reaction types. In some cases shock therapy may act as a planned fear reaction which may bring about an interruption of abnormally established thought habits and permit a reorganization and readjustment of a more normal thought flow. Or the action of shock therapy may in a broad sense be likened to a form of counter-irritation. Undesirable habit thought patterns are forcefully replaced by a real and visible threat to the organism and through activation and motivation the patient is brought back to face realities. In some of the depressed cases it may bring relief from a feeling of guilt by their willingness to submit to shock therapy which they regard as a punishment. Other patients may summon all of their resources to

face reality in order to avoid further treatment. But the writer believes that "treatment by excitation" according to Janet's use of this term is the modus operandi in all forms of shock therapy. It must be emphasized, however, that additional means of psychotherapy such as explanation, reeducation and guidance in conjunction with shock therapy are necessary to procure the best results.

Comparison of the Current Forms of Shock Treatments

The writer believes that all forms of pharmacological and electrical shock therapies produce similar effects since all are psychophysiological methods. Two conditions are known to occur: (1) powerful stimulation of the autonomic nervous system, followed by (2) depression or temporary inhibition of the higher cerebral centers. Increased pulse rate, elevation of the blood pressure, dilatation of the pupils, flushing of the skin, and increased salivation are some of the evidences of autonomic nervous system stimulation. After this stimulation the higher centers are depressed or temporarily paralyzed by the resulting coma or unconsciousness in pharmacological and electrical-convulsive shock therapies.

In a search to find a safe and better controlled substitute for pharmacological and electrical-convulsive shock therapies, the writer devised a method which he believes can produce similar effects by safer means. For stimulation, a faradic current well within the margins of safety is used in place of drugs. This current is not strong enough to produce convulsions or irreversible physiological changes. Immediately following a brief series of electrical shocks which are applied to the patient's head, an intravenous barbiturate (pentothal sodium) is administered for a quick anesthesia. In non-communicative and stuporous patients, additional information regarding their condition may be obtained by using a subanesthetic dose of intravenous sodium amytal instead of pentothal sodium. By the use of either drug the higher centers are temporarily inhibited and the patient is left in a relaxed condition which is attained under better control than is possible with the other shock methods. An immediate improvement may be obtained in stuporous and non-communicative patients with intravenous sodium amytal alone, but this change is very temporary. A full description of the apparatus and technic of faradic shock therapy has been published.[4]

In all methods it appears that best results are obtained when the personality is acutely and more or less totally involved and when the psychotic symptoms are decidedly unpleasant to the patient. In so-called catatonic and paranoid types of schizophrenia the results are far superior to those obtained in the simple and hebephrenic types. In the more chronic forms an adjustment is usually made at a lower level of mental activity. After six months to two years it appears that the psychotic symptoms become less disagreeable to the patient, and consequently they are less likely to respond to shock therapy. In the affective disorders the depressed types respond far better to shock therapy than the hypomanics and manics for these latter types usually retain a keen awareness of their position and environment and have fewer unpleasant symptoms which annoy them. Most dramatic results are obtained in acute hysteria for recovery usually takes place with the first treatment with convulsive or faradic therapy. The chronic forms of psychoneuroses are not greatly benefited by shock therapy. In these individuals the personality is partially involved over a long period of time and they have been in the habit of making only partial adjustments. Temporary results are obtained in this group after the first few shock treatments are given, but lasting results can hardly be expected since most of these patients do not want to get well emotionally, thought they may want to intellectually.

The relative efficacy of the different types of shock therapies remains to be established. Since mental disorders are not definite entities and in each case many complicating conditions exist, this question will not be answered until extensive statistical studies of the different methods are carried on over a considerable period of time. More rapid response is noted with metrazol, electrical-convulsive and faradic shock than with insulin hypoglycemic shock treatment. Improvement is usually noted within the first five treatments whereas with insulin-hypoglycemic shock the response is more gradual and a longer series of treatments is usually required. Some workers[35] have found that catatonic excitement and paranoid types react more favorably to insulin while stuporous patients respond best to metrazol. Others[17] believe that results with metrazol

closely parallel those with insulin. They recommend that metrazol treatment be given first since it is less expensive, for it requires less time to administer. Some[13] recommend combining or alternating these methods. The writer believes that the least drastic method (such as faradic shock) should be tried first. If the results are not favorable other methods may then be used. Using faradic shock therapy the writer obtained relatively as favorable results in all types of mental disorders as those claimed with other forms of shock treatment. With faradic shock treatment improvement is usually noted after the second or third treatment. This treatment is as inexpensive to administer as any of the shock treatments now in use.

All forms of shock treatment should be considered merely as an adjuvant to psychotherapy. Other forms of psychotherapy are essential. Shock treatment may relieve the patient of acute psychotic symptoms, but it does not materially alter his constitutional makeup. For this reason it is understandable why relapses may occur among patients who have had remissions through shock therapy as well as among those who have had spontaneous remission. But it has been found that many patients who have relapsed after shock therapy frequently respond to further treatment. When remissions are brought about by shock therapy the ultimate prognosis may be more favorable, since by terminating the psychosis abruptly through a specific means a better opportunity is offered to explain to the patient how his mental illness came about and to point out how further recurrences may be avoided.

Summary

Since insulin-hypoglycemic shock therapy was first introduced, several different forms of pharmacological and electrical shocks methods have been tried. The effectiveness of many of these shock treatments in mental disorder is now generally conceded but a search continues for safer methods.

Shock therapy is not a new procedure. It was used in many crude forms for centuries but one of its chief dangers was creation of exhaustion.

In the current forms of shock treatment two conditions are known to occur: (1) stimulation of the autonomic nervous system, followed by (2) inhibition of the higher centers. The former condition acts as a "treatment by excitation" and the latter prevents exhaustion. Similar conditions are produced under better control with faradic shock therapy and comparable results are more safely obtained. Its use is recommended before resorting to more drastic methods.

No form of shock therapy can be expected to alter materially the original constitutional makeup of an individual but it may remove acute and unpleasant psychotic symptoms.

Shock treatment should be regarded as an adjuvant to psychotherapy and for best results other psychotherapeutic procedures commonly used are essential.

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FEEDING THE PREMATURE BABY*

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THE care of the premature infant is one of the most fascinating problems in medicine. More and more interest in their care has been shown by the medical profession. It is a thrill indeed to see one of these tiny shrivelled dusky mites transformed into a healthy infant in a matter of weeks. Their progress is so rapid if they are properly treated that one can see the change in them from day to day and although the care they demand is much more time-consuming and specific than a normal newborn baby, the satisfaction derived from their progress fully repays one.

This discussion is intended primarily for the practicing physician who has but occasional use for information on the premature infant. Recently more requests have come for information on feeding than any other phase of premature care, and feeding, while no more important than any of the other phases, is perhaps the most difficult part of their care because it needs superpatience and care on the part of the attendants as much as promptness and exactness.

Taking it for granted that the physician is able to cope with the problems of keeping an ideal temperature and humidity for the baby and that an adequate isolation or aseptic technic has been set up to prevent upper respiratory and skin infections, the feeding problem can take our entire time.

The infant is not disturbed for feeding for a period of 16 hours or more after birth. This rule is not changed under any condition. The temperature of the bassinet is regulated as necessary to accommodate the baby's temperature. The admission temperature of the crib is always 100° F. but it is seldom necessary to have it that high for more than 2 to 4 hours and thereafter it is gradually lowered so that after a period of 24 to 48 hours the crib temperature is adequate when kept at 86° F.

Although the foremost aim of this 16-hour period is complete rest, the infant's temperature must be checked every 2 hours while the crib temperature is high, and his general condition must be watched closely especially for respiratory difficulty.

If the baby's condition is good after 16 hours have elapsed, feeding is begun. If, however, the infant's condition is poor, the rest period is continued for another 4 to 8 hours or until the baby has improved.

As in full term infants, the premature baby has a loss of weight during the first few days of life. However, the loss in a premature infant is relatively greater than in a newborn and is regained more slowly. The loss in weight should not average more than 7 to 8 per cent of the birth weight.

After the first few days, the total fluid intake should be maintained at from one-sixth to one-eighth of the body weight in each 24 hours. The sum of the water and milk intake determines the total fluid intake.

A good method for obtaining the required fluid intake during the first few days of life is to give subcutaneous fluids. Hartmann's solution or Ringer's solution may be used. The needles (20 gauge intravenous) are inserted into the inner aspect of the thigh just above the knee and passed toward the midpoint of the inguinal ligament. This should be administered very slowly, preferably by continuous drip. For a small premature, that is one weighing less than 1,500 grams (3.3 pounds) 50 to 75 c.c. of the solution is sufficient. This is given the third day

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and may be repeated daily if the baby is taking fluids poorly. Premature infants over 1,500 grams (3.3 pounds) to 2,000 grams (4.4 pounds) may be given 75 to 100 c.c. of the solution and those babies weighing more than 2,000 grams may be given 100 to 125 c.c. of the solution. Usually if an infant weighs more than 1,500 grams (3.3 pounds) only one subcutaneous injection is necessary, but the very small babies frequently need two or more.

In addition to fluids, whole citrated blood may be administered to the premature infant with beneficial results. This is most frequently given the day before subcutaneous fluids are started (during the second 24 hours of life). When this procedure is performed, 10 c.c. (⅓ ounce) are given to the small babies (1,500 grams or less in weight) and up to 30 c.c. (1 ounce) to the larger babies. The procedure is a simple one. A 3-inch No. 19 or 20 gauge infiltration needle is introduced into the subcutaneous tissue in the kidney region of the back. The needle is inserted deeply and passed up parallel to the spinal column to the sub-scapular region. As the needle is withdrawn, the blood is injected leaving a column of blood almost the length of the back. The needle puncture point is sealed with collodion on a small piece of cotton. Blood is injected on both sides of the midline. If the infant is placed on his abdomen over a small blanket roll so that the back is slightly arched, the blood may be injected with little difficulty.

The feeding schedule is a controversial point among many pediatricians. Some doctors advocate frequent small feedings; others give larger amounts with longer intervals between feedings, The latter method has one important advantage in that it gives the baby more rest. Both methods are successful if used intelligently. At the Minneapolis General Hospital the 4-hour schedule has been used for the last 8 years successfully.

The prematures are divided into three groups according to their weights: the first group is made up of those weighing 1,500 grams (3.3 pounds) or less, the second group includes those between 1,500 grams and 2,000 grams (4.4 pounds) and in the third group are those weighing 2,000 grams or more.

After the 16-hour rest period the first group is offered 10 c.c. (⅓ ounce) of water every 2 hours during the remainder of the first day and thereafter every 4 hours. After the first 24 hours the amount of water offered is increased by 2 c.c. with each feeding until 30 c.c. (1 ounce) are reached, and this amount is continued until the tenth day. After 10 days one ounce is given twice a day at 8:00 A.M. and 4:00 P.M. If the baby has difficulty taking fluids by mouth, the water is discontinued and given subcutaneously.

Milk feedings are begun at the end of the first 24 hours. Beginning with 5 c.c. of breast milk with 2 per cent calcium caseinate (Casec) every 4 hours, the amount is increased by 1 c.c. with each feeding until 50 c.c. (1⅔ ounces) are offered. Further increase in feeding depends upon the progress of the infant. Usually the feeding may be increased from 2 to 5 c.c. per day thereafter. If any regurgitation takes place, the amount is immediately decreased.

The second group is also given 10 c.c. (⅓ ounce) of water at the end of the 16-hour rest period, and this amount is repeated every 2 hours for the remainder of the first 24 hours. Thereafter water is given every 4 hours and with each administration the amount is increased by 2 c.c. until 45 c.c. (1½ ounces) are reached; then decreased by 2 c.c. until 30 c.c. are reached. This is continued until the tenth day. After ten days an ounce of water is given only twice daily as in group one.

Beginning at the end of 24 hours, 10 c.c. (⅓ ounce) of the milk feeding are given. As in group one these feedings are given every 4 hours (at the alternate 2-hour period water is given), increasing the amount by one c.c. with each feeding until 60 c.c. (2 ounces) are reached. Further increase is ordered as the baby demands it which is usually about 5 c.c. per day until 3 or 4 ounces have been reached.

Prematures in the third group are started with 15 c.c. (½ ounce) of water at the end of 16 hours. This amount is given every 2 hours until the end of the first day. Thereafter the water is given every 4 hours increasing with each administration by 2 c.c. until 45 c.c. (1½ ounces) are offered; then decreased by 2 c.c. each feeding until 30 c.c. (1 ounce) are given. At the end of the tenth day 30 c.c. of water are given only twice daily at 8:00 A.M. and 4:00 P.M., just as the first and second groups.

At the end of 24 hours the third group is offered 15 c.c. (½ ounce) of milk feeding. This feeding is given every 4 hours (at alternate hours with the water) increasing the amount

by 2 c.c. with each administration until 45 c.c. (1½ ounces) are given. The amount is then increased by 5 c.c. a day until 75 c.c. (2½ ounces) are reached. Additional increase in the feeding depends upon the progress of the infant. In most cases the feeding can be increased by 5 c.c. daily to 105 c.c. (3½ ounces). Babies weighing over 2,250 grams may require more food than is indicated in the above routine. If the infant will take more formula, the amount may be increased more rapidly.

Little can be expected in the way of weight gain until about 45 calories per pound (90 calories per kilogram) are administered. Later the infant may require as much as 60 calories per pound. Rather than to pay too much attention to total calories, a factor which has in the past been over-emphasized, it is a good plan to feed the premature infant an amount sufficient for an adequate consistent weight gain.

For the sake of clearness, the schedule is presented as follows:

ROUTINE OF FEEDING FOR THE PREMATURE INFANTS

	Milk—c.c.			Water—c.c.*		
	1	2	3	1	2	3
First Day:						
16th hr.				10	10	15
18th hr.				10	10	15
20th hr.				10	10	15
22nd hr.				10	10	15
Second Day:						
1st F.	5	10	15	12	12	17
2nd F.	6	11	17	14	14	19
3rd F.	7	12	19	16	16	21
4th F.	8	13	21	18	18	23
5th F.	9	14	23	20	20	25
6th F.	10	15	25	..	..	..
Third Day:						
1st F.	11	16	27	22	22	27
2nd F.	12	17	29	24	24	29
3rd F.	13	18	31	26	26	31
4th F.	14	19	33	28	28	33
5th F.	15	20	35	30	30	35
6th F.	16	21	37	..	..	..
Fourth Day:						
1st F.	17	22	39	30	32	37
2nd F.	18	23	41	30	34	39
3rd F.	19	24	43	30	36	41
4th F.	20	25	45	30	38	43
5th F.	21	26	50	30	40	45
6th F.	22	27	50	..	..	..
Fifth Day:						
1st F.	23	28	50	30	38	43
2nd F.	24	29	50	30	36	41
3rd F.	25	30	50	30	34	39
4th F.	26	31	50	30	32	37
5th F.	27	32	50	30	30	35
6th F.	28	33	50	..	..	..
Sixth Day:						
1st F.	29	34	55	30	30	33
2nd F.	30	35	55	30	30	30
3rd F.	31	36	55	30	30	30
4th F.	32	37	55	30	30	30
5th F.	33	38	55	30	30	30
6th F.	34	39	55	30	30	30
Seventh Day:						
1st F.	35	40	60	30	30	30
2nd F.	36	41	60	30	30	30
3rd F.	37	42	60	30	30	30
4th F.	38	43	60	30	30	30
5th F.	39	44	60	30	30	30
6th F.	40	45	60	..	..	..
Eighth Day:						
1st F.	41	46	65	30	30	30
2nd F.	42	47	65	30	30	30
3rd F.	43	48	65	30	30	30
4th F.	44	49	65	30	30	30
5th F.	45	50	65	30	30	30
6th F.	45	51	65	..	..	..
Ninth Day:						
1st F.	46	52	70	30	30	30
2nd F.	47	53	70	30	30	30
3rd F.	48	54	70	30	30	30
4th F.	49	56	70	30	30	30
5th F.	50	58	70	30	30	30
6th F.	50	60	70	..	..	..
Tenth Day:						
1st F.	50	60	75	30	30	30
2nd F.	50	60	75	30	30	30
3rd F.	50	60	75	30	30	30
4th F.	50	60	75	30	30	30
5th F.	50	60	75	30	30	30
6th F.	50	60	75	..	..	..
Eleventh Day:						

Further increases in feeding depend upon progress made.

F.—Feeding.
1—Prematures 3.3 lbs. (1,500 grams) or less.
2—Prematures 3.3 and 4.4 lbs. (1,500—2,000 grams).
3—Prematures 4.4 lbs. (2,000 grams) and more.

*If specified amount of water cannot be taken orally, give it in small doses, subcutaneously as physiological or isotonic saline.

The feeding most easily assimilated by the premature baby is human milk. The mother should be taught by the doctor or a competent nurse to express her breasts as soon as the milk comes into them. If this procedure is carried out correctly and conscientiously every 4 hours, 5 times in 24 hours, her breasts will stay stimulated and give an adequate milk supply for her baby. If the mother is unable to produce enough milk, an effort should be made to obtain it from some other source at least until the baby weighs 2,500 grams. The milk collected over a period of 24 hours is boiled 1 to 2 minutes and 2 per cent Casec is added to it. The addition of calcium caseinate (Casec) has been found to definitely reduce the number of cases in which frequent liquid stools have developed and has led to a satisfactory and consistent gain in weight. As long as the amounts are graduated,

each feeding should be poured into a separate bottle and labeled with the amount and the time that the feeding is to be given.

Because economic and physical conditions often make it impossible for the physician in a small community to obtain breast milk, scientific investigations have been made with the result that a preparation has been formulated which is an adequate substitute. The observation that premature infants have low values for serum protein during the first 3 months of life led some physicians to experiment with the addition of protein content to the milk feeding for the premature baby. It was finally discovered that the simple fortification of cow's milk with 1 to 3 per cent calcium caseinate gave the most satisfactory results. Extensive studies have been made in the fat metabolism of normal, premature and twin infants. It was found that premature babies did have marked difficulty in fat absorption. There was also striking differences in the ease with which the different fats were absorbed. Olive oil was more completely absorbed than butter fat, and thus when olive oil was substituted for butter fat, there was a more rapid gain in weight. A product containing both calcium caseinate and olive oil was developed. This product (Olac) is made up of skimmed milk solids, calcium caseinate, olive oil, and dextrimaltose. In view of the fact that vitamin A is removed when the cow's milk is skimmed, halibut liver oil is added. Olac with which no doubt a number of you are already familiar comes in powder form. It is simple to prepare: one part of Olac is slowly added to 5 parts of sterile water. In a study made at the Minneapolis General Hospital in which Olac was compared with the breast milk-casec formula and with an evaporated milk formula, it was found that it compared favorably with the breast milk formula in that it was easily assimilated by the infants weighing 2,000 grams (4.4 pounds) or less, and surpassed the evaporated milk formula. As for the larger infants, those weighing over 2,000 grams (4.4 pounds), the group that received Olac made a better showing than either of the other two groups which were fed the breast milk and the evaporated milk mixture. Because of the added cost of this product the babies are often placed on an evaporated milk formula which they can tolerate more easily as they mature. If the premature babies are given Olac until they are the weight of normal newborn babies, it is usually sufficient.

In the presence of loose stools which in our experience is comparatively seldom, 2 per cent Casec added to the Olac, gives a good response.

The evaporated milk formula is made up of equal parts of evaporated milk and sterile water with 3 per cent dextri-maltose. Although it is assimilated less easily than those already discussed, it has given good results especially in the larger premature babies.

Feeding the premature baby is one of the major considerations in the nursing care. Every precaution must be taken to insure cleanliness in the preparation of feeding and fluids, and it is essential that feedings be kept warm throughout the time they are being given. Three methods are commonly employed:

1. The gavage or catheter method is frequently used.
2. A medicine dropper protected by a rubber tip may be used. If correctly employed it is a good method, but it is harder than other methods to teach to the personnel.
3. Bottle feeding is used but conservation of the baby's strength is here to be considered.

Gavage is done to conserve the strength of the very small infant. Too often it is employed only as a time-saving measure. As irritation and injury to the nasal mucosa may result from nasal gavage, the oral route is preferred. Many babies weighing less than 4.4 pounds (2,000 grams) must be fed by catheter. If this is necessary, a No. 10 French catheter is used for small prematures; a No. 12 French catheter for larger prematures. The length of catheter to be passed is measured as the distance from the tip of the ensiform cartilage to the bridge of the nose. It may be marked at this point with silver nitrate. The average length is 4 to 5 inches, which will bring the tip of the catheter just to the cardia of the stomach. The catheter is moistened with water before passage. The sterile catheter or tube is carefully passed by mouth, not allowing it to go beyond the mark. There should be a catheter for each infant. The baby may be supported in a semi-recumbent position, and after becoming quiet is slowly fed. When the procedure is complete, the tube is kinked and removed quickly. The infant is supported in the sitting

position, in the crib, to allow for the expulsion of air. The baby is watched carefully at the time of feeding and for a while after the tube is removed to see if it is going to regurgitate. If regurgitation should occur, the head and shoulders are lowered and the baby is turned face downwards. As soon as the infant has been tube-fed, it is turned to the right lateral position. This nursing care is one of the most important factors in preventing otitis media and bronchopneumonia due to aspiration.

Infants weighing over 4.4 pounds (2,000 grams) may often be fed by medicine dropper which is considered by many to be the method of choice. Patience and care on the part of the nurse are prerequisites to success. Drop by drop the fluid is placed on the dorsum of the tongue, trickles down and is swallowed. To avoid aspiration of feeding it is essential that the nurse support the infant in a semi-sitting position and before replacing him flat on the mattress she must inspect his mouth and throat to determine that all the feeding has been swallowed. Babies usually begin to nurse from the bottle when they approach 5 pounds (2,300 grams) in weight.

Premature babies give signs of vitamin deficiency early in life unless their diets are well fortified with the essential ones. Vitamins aid greatly in the progress of the infants and it is wise not to let more than two weeks elapse before they are added to the diet.

Ten drops of a water soluble antirachitic preparation (Drisdol) may be added twice daily to the formula of the babies weighing less than 2,000 grams (4.4 pounds). One teaspoon of fresh orange juice may also be given twice a day. If the baby does not take fluids well by mouth, the orange juice may have to be given by the gavage method. When the babies reach or are 2,000 grams (4.4 pounds) or more in weight, they may receive Oleum Percomorphum (50 per cent), White's Cod Liver Oil Concentrate, or Viosterol in Halibut Liver Oil. Ten drops of any one of these preparations should be given twice a day in a small amount of orange juice. Cod Liver Oil or concentrates (oily preparations) should not be added to the formula since a large proportion of the oil sticks to the bottle and the nipple. The amount of orange juice can be increased gradually from 1 to 2 teaspoons twice a day.

In connection with feeding, one is faced with three complications common to premature babies. They are persistent regurgitation, vomiting, and diarrhea.

Regurgitation may often be simply corrected by intelligent nursing care, that is by feeding more slowly and carefully, by elevating the baby's head while feeding, or by placing the baby in a semi-sitting position when half the feeding has been taken, and again when it has been completed, to allow the baby to belch. It may be too that the baby is being overfed, and that his spilling over can be corrected by decreasing the feedings temporarily, then slowly increasing after regurgitation has ceased. When vomiting occurs no further increase in feeding should be made. It may actually be necessary to stop the formula for one or two periods, or at least to decrease the volume and increase the number of feedings until the vomiting has stopped. The physician must determine this in each case.

If diarrhea (water stools) occurs, the first and most important consideration must be an increase in fluids. The simplest method of doing this is to give Hartmann's solution by hypodermoclysis. The formula is discontinued for 1, 2 or 3 feedings, after which they may be resumed by using small amounts of an easily assimilated food, and gradually increasing the volume to requirements. The breast milk-calcium caseinate preparation or Olac with the addition of calcium caseinate are best employed in these cases. Weak tea or one-half strength Hartmann's solution may be given by mouth in the interval when no milk feeding is used. All antirachitic and antiscorbutic therapy should be discontinued while either diarrhea or vomiting exist.

If there is no improvement in the diarrhea, whole blood may be given deep subcutaneously. Intravenous therapy though usually difficult to perform, is most effective in this situation. The Hartmann's solution given by slow continuous administration, about 3⅓ ounces (100 c.c.) to small infants and as much as 6 ounces (200 c.c.) to the larger premature infants, may be repeated daily until the baby is able to take adequate fluids by mouth.

During a siege of vomiting or diarrhea the infant should be weighed daily so that its course may be watched closely. If there is a weight loss, concentrating the breast milk two-thirds

(Continued on Page 70)

HISTORY OF MEDICINE IN DAKOTA COUNTY

(Continued from December issue.)

1890-1900

The cost of the medical attendance on the poor mounted during the nineties. In 1894 the physicians of the county offered to do all of this work for the sum of $1,500. This proposition was refused by the commissioners because it seemed too expensive. Nevertheless a rough estimate of the bills sent in by the individual physicians for that year shows that the county saved, at most, only a few hundred dollars. The following year the total cost was well over $1,700. As a result the county was divided into specific districts, each of which enjoyed the services of a physician at a fixed salary. In this way the total was kept at approximately $1,100 per annum. The districts were as follows: (1) Hastings, Ravenna, Nininger, the north half of Marsham and the east half of Vermillion; (2) New Trier, Hampton, Randolph, Douglas and the south half of Marsham; (3) poor farm, Rosemount, Lebanon, and west half of Vermillion; (4) Lakeville, Eureka, Burnsville, Greenvale, Waterford, Scotia; (5) Farmington, Empire, Castle Rock; (6) South Saint Paul, West Saint Paul, Inver Grove, Eagan and Mendota. Almost every reputable physician at one time or another served in the capacity of county physician.

The position of health officer in Hastings was filled by J. C. Fitch, Peter Schneider, J. J. Schmitz, A. M. Adsit, and H. G. Van Beeck. The third name in the list is that of a veterinary. At the time of his election in 1897 the mayor announced that the salary of the health officer would be $100 for the year "if he attended to his duties." Previously the salary had been less than this. There is nothing to indicate that the health officers were not in the habit of "attending to their duties." They reported births and deaths, saw that the city was cleaned up every once in a while, checked up on the contagious diseases in town, advised the muzzling of dogs, and on several occasions suggested better ventilation and more blankets for the city jail. The reports were usually "accepted and placed on file" by the city authorities.

Members of the pension examining board in the nineties were Dr. J. M. Tucker and Dr. H. G. Van Beeck. Dr. Van Beeck and Dr. J. C. Fitch did most of the examining of the insane in the county.

Among the first and best known of the physicians who opened offices in the county during this decade were Peter Schneider of Hastings, and W. H. Cooke of Lakeville. Dr. A. A. Finch and Dr. A. B. Hawes both practiced in Hastings with their fathers for short periods. Others who came a little later were Drs. R. E. Cavanaugh, Wm. M. Dodge, J. G. Hodgkinson, A. O. Beal, A. G. Phelps, F. H. Ford, Charles Cappellen and C. A. Faulkner. Most of the latter group did not remain in the county

As in the preceding decade the only diseases that affected the community to any extent were scarlet fever and diphtheria. There was a slight alarm caused by the former in November, 1895. As to diphtheria there were a number of cases

almost every year and the toll of deaths, although not long, was, nevertheless, steady. The local health officers showed themselves to be active in quarantining cases and giving instructive lectures. In December, 1899, a special meeting of the Hastings city council was called at the instance of the board of health to devise means of controlling the diphtheria cases in town. The following regulations as printed in the *Hastings Gazette*, December 9, 1899, were adopted:

1. All cases of sore throats reported to the health officer to be temporarily quarantined.
2. All people found endeavoring to evade the law to be prosecuted by the health officer.
3. Three physicians to be engaged to visit the schools daily and all suspicious cases to be temporarily quarantined and a swab taken for examination.
4. These physicians to ascertain the condition of health of all absent children in their respective schools.
5. Health officers to enforce the quarantine according to the law.
6. The three physicians appointed to report daily to the health officer.

While efficient physicians adopted up-to-date theories and methods, many an old-timer in the country continued to practice on the basis of his practical experience, as he had learned little or nothing since he left medical school some thirty or forty years before. Such for example, was Dr. Percival Barton, an able practitioner, but a confirmed enemy of all new theories. It is rather pathetic to find him, as late as 1895, writing an article for the *Northwestern Lancet* in which he assailed the germ theory, maintaining that bacteria are the result and in no case a cause of illness.

Biographies

E. D. Abell came to Farmington about 1878 and practiced there for many years.

Charles Powell Adams, one of the outstanding men of Dakota County, was born in Pennsylvania in 1831. He was of Scotch-English and German descent. At the age of eighteen he began to study medicine with Dr. W. R. Waddell of West Bedford. He also studied in Knox County, Ohio, with Drs. Connelly and Pierce, and graduated from the Ohio Medical College in 1851. The next year he began practice in Indiana but his health was impaired by overwork and an attack of malaria and he moved to Hastings. In 1859, Dr. Adams bought a grocery store which he ran for a number of years and about the same time he began the publication of a newspaper, the *Hastings Democrat.*

In May, 1861, Dr. Adams enlisted as a private in the Dakota County Volunteers and was elected captain of his company. He was promoted the next year to the rank of lieutenant-colonel in the First Minnesota Regiment and in March, 1865, he was made a brigadier-general. We take the following paragraph concerning his war experiences from Neill and Williams' history of Dakota County:

"He was in every battle from the first Bull Run to Gettysburg, and was an unusual sufferer from wounds. His first wound was a slight one in the left groin, at Malvern Hill, July 1, 1862; at Antiatam, September 17, 1862, severely in the left shoulder; at Gettysburg, July 2, 1863, six times, through the left cheek and left lung, in the groin, in the left thigh, breaking the femur, and one in the abdomen. He was left for dead on the field, but was found and cared for by his comrades and was taken to the hospital at Littlestown and thence to Baltimore, Maryland. For eighteen months a crutch was necessary to enable him to walk, and, as relics of the conflict, he carries in his body two bullets and one buckshot."

After the close of the Civil War, Dr. Adams commanded a corps of cavalry and artillery against the Sioux in 1866 and was successful in spite of the heavy snow and cold weather. In 1877 he was elected president of the newly organized Dakota County Veteran Association.

Dr. Adams was a charter member of both the Minnesota State Medical Society (1869) and the Dakota County Medical Society (1870) and held offices in both organizations. He was affiliated with the American Medical Association, attending many of its meetings, an honorary member of the California State Medical Society, a member and ex-president of the Rocky Mountain Medical Society.

Dr. Adams was active in local and state politics and was a member of the Democratic party. In 1856 he was elected a member of the territorial legislature and was appointed chairman of the committee on corporations. He served as mayor of Hastings in 1873 and in 1878 was elected a member of the state senate from Dakota for a four-year term.

Dr. Adams was married three times. He died on his farm in Vermillion in 1893 at the age of sixty-three.

Alfred Adsit was born in 1857. He attended the Detroit Medical College, Michigan, and the Columbus Medical College of Columbus, Ohio, from which he graduated in 1881. After specializing in eye and ear work at the Massachusetts General Hospital of Boston he located in Hastings in 1885 where he remained until his death. In 1908, with Drs. Clark and Wall, he opened a private sanitarium there. He was house physician at the Hastings State Asylum, served on the school board and was a member of the state and national medical bodies. For a number of years he was health officer of Hastings and he also served as county physician.

J. L. Armington practiced in Hastings during the sixties and seventies with the exception of several years spent at Northfield, Minnesota, and in Utah. He was a surgeon in the Second Minnesota Regiment during the Civil War.

E. D. (or E. G.) Ault, a graduate of McGill University, Canada, came to Hastings to practice with Dr. J. E. Finch in 1868. About a year later he moved to Dundas, Rice County.

E. D. Ayres came to Hastings in the fifties. The first definite indication of his residence there is the appearance of his card in the *Dakota Weekly Journal* in May, 1856. He was also a wholesale and retail dealer in drugs.

Percival Barton was born in Maine and came to Saint Paul in 1853. Thence he went to Inver Grove where he practiced medicine and also operated a steam saw mill. Subsequently he took up a claim in Waseca County but returned after a year to Inver Grove where he remained. During the war he enlisted with the Seventh Minnesota Volunteer Infantry as assistant surgeon. He graduated from the University of Pennsylvania in 1849 but practiced under an exemption certificate. He served as county physician for a number of terms and he served his immediate locality as justice of the peace. He was an able and sympathetic country practitioner and he also gave much time to business interests.

(To be continued in February issue.)



B. J. Branton, M.D.

President, Minnesota State Medical Association

President's Letter

OUR PLACE IN SOCIETY

TO the men of the medical profession in Minnesota, the new year of 1941 offers another opportunity to be of service to the people of this great commonwealth. At no time in history has it been so necessary to make ourselves cognizant of the vitally important place that we play in the life of the state as well as the economic well-being of the people as the present. We are a part of the people and subject to the same unrest in which they find themselves.

Someone has said that a building is only as strong as its foundation, and again, that a tree can only survive if its roots are deep-seated and strong. So our medical profession has the confidence of the great majority of the people because it has a solid educational foundation, and it has a deep, vigorous root in the affection of the people because of its strength of purpose.

Today we find our profession most necessary to the people, not only those specializing in the various branches of the work, but likewise those who find their places as general practitioners throughout the length and breadth of the state, administering to the individual in all strata of society, the wealthy, the middle-class and the indigent being given no preference.

Where is there another profession so necessary to the present military program, to industry, to sanitation? What other profession can control the health in the schools, both grade, college and university? I ask you, could the health boards or departments, the state sanatoriums, hospitals and penal institutions exist without the medical man? No, we have our place to fill as no other can. We are indispensable to the life of the people.

We must exercise the heritage left us by our predecessors. We must be the leaders, not the followers, in the disseminating of medical lore. We can well afford to coöperate with lay health movements, but should take the initiative by instituting their programs.

The good neighbor attitude should be prevalent in our relationships between ourselves; friendships should be lasting; the words "competitor" and "competition" deleted from our dictionaries.

Our medical world is organized on pure democratic principles. It is a privilege to belong to the American Medical Association, the Minnesota State Medical Association and our County Societies and to be a part of them by exercising our right of franchise, by lending our support to their worthy movements, making ourselves felt in their deliberations, using our officers to carry out our wishes, our committees to do our researches, our state office to help us when questions of procedure arise. While our work is scientific, we must live under and submit to economic laws.

We cannot stand still. American initiative will not allow it. Let the New Year be our opportunity to build our place in society to greater heights.

B. J. Branton, M.D., *President*

Minnesota State Medical Association

Editorial

MINNESOTA MEDICINE

Official Journal of the Minnesota State Medical Association

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BUSINESS MANAGER
J. R. Bruce

Volume 24 JANUARY, 1941 Number 1

THE NEW YEAR

WHAT 1941 holds for America is predictable only in part. The new year will see considerable disturbance in the routine of affairs, both economic and medical. Thousands of individuals cannot be uprooted and transplanted to other localities and occupations without disturbing the usual placidity of life. The enormous expansion of military and manufacturing organizations incident to preparedness plans will necessarily be accompanied by some confusion due to inexperience. We may as well face the fact that there will be some individuals who for various reasons will not step in line. Perhaps lack of coöperation will be more in evidence than if we were actually at war. Public opinion in a country at war tolerates no shirking. There is not as strong an urge in a preparedness campaign for a war that possibly may not materialize. We have had a valuable example in France, however, of a country not united in its defense program, although she knew her neighbor was working overtime to build up its war machine. The unions of France would not lengthen their weekly work schedule. France is paying the penalty now and is learning that there are things worse even than war.

Japan's alliance with the Axis countries and Russia instead of intimidating the United States as intended, only made very evident the need for defensive armament on a large scale. An important question for us to decide in the near future will be whether we prefer to meet this foreign combination at some future date, possibly alone, or at an earlier date in alliance with a powerful empire. We are not prepared to take either step at present and the need for a vigorous preparedness campaign is only too apparent. Production so far has not met expectations and needs.

The medical profession has its part to play in preparedness. It is clear that this should be the main job for the medical profession in 1941 and that all matters such as government suits and agitation for changes in the fundamentals of medical practice should be indefinitely postponed.

THE NATIONAL PHYSICIANS' COMMITTEE

THE National Physicians' Committee is beginning its second year of life. Over 8,000 physicians over the entire country have contributed to its support. It is doing a most important work in educating the public as to the achievements of medicine and the advantages of the present form of medical practice. It is essential to counteract undesirable propaganda for state control of medicine. This committee has objectives in influencing the public similar to those of our state association through the work of its various committees on legislation, public health, interprofessional relations and radio, but it is approaching them differently and on a nation-wide scale. It is doing work that the American Medical Association cannot do and maintain

the status under which it has operated since its organization some ninety years ago.

The following facts serve as a portrayal of the work done by the committee during its first year of existence:

1. Speeches at twenty state medical association meetings.
2. Approximately 500 county medical meetings.
3. The encouragement of physicians to appear as speakers at meetings of Chambers of Commerce, Rotary, Kiwanis, and other luncheon clubs, women's organizations and on local radio broadcasts.
4. Two double-truck advertisements in the *Saturday Evening Post.*
5. Approximately fifty full-page newspaper advertisements (These were placed under local sponsorship.).
6. The distribution of approximately 1,092,000 letters and more than 2,000,000 booklets and other printed matter.

We believe that a firm foundation has been laid for further progress. The influence exerted by the National Physicians' Committee is evidenced by what President Roosevelt stated at the dedication of the National Institute of Health, at Bethesda, Maryland. He said:

"Neither the American people nor their government intend to socialize medical practice any more than they plan to socialize industry. In American life the family doctor, the general practitioner, performs a service which we rely upon and trust.

"No one has a greater appreciation than I of the skill and self-sacrifice of the medical profession. And there can be no substitute for the personal relationship between doctor and patient which is a characteristic and a source of strength of medical practice in our land."

The great basic need, that of a liaison with the public has never been more pressing and important than it is at this time. Preservation of the pattern of American Medicine is dependent on the wider knowledge on the part of the public of the problems, methods, aims, and practice, and, to the extent possible, the philosophy of American medicine under our system of independent practice.

With proper support by the physicians of the country, the National Physicians' Committee, in conjunction with the A.M.A. and the component state medical associations, is in a position to be of great influence and to lay before the American people the ideals of American medicine, and what American medicine has accomplished.

Eleven and four-tenths per cent of the doctors of Minnesota, or a total of 351 individuals, have contributed toward the support of the national committee during the past year. It is of interest to note the percentage of contributing doctors in the following states:

Arizona—13 per cent
Idaho—15 per cent
Montana—12 per cent
Nebraska—10 per cent
Nevada—12 per cent
North Dakota—15 per cent
Oregon—13 per cent
Utah—16.5 per cent
Washington—17 per cent

There is no reason why Minnesota should not head this list in 1941.

This is an appeal to the physicians of Minnesota to contribute in 1941 as liberally as possible toward the support of this committee. This committee is depending on you and earnestly seeks your aid. Checks should be made out to Dr. N. S. Davis, III, and mailed to him at the Pittsfield Building, Chicago, Illinois, in care of the National Physicians' Committee.

F. J. Savage† and W. F. Braasch*

Correction.—In the editorial entitled "The Blood Bank" published on page 870 of the December issue of Minnesota Medicine, the authors should have appeared as Dr. J. S. Lundy and Dr. Thomas H. Seldon. Through a typographical error, Dr. Seldon's name was misspelled in the final printing.

STATE MEETING

The annual meeting of the Minnesota State Medical Association will be held at the Saint Paul Auditorium May 26, 27 and 28, 1941.

The committee on Scientific Assembly consists of Dr. O. W. Holcomb, Saint Paul and Dr. A. N. Collins, Duluth, surgical section; Dr. H. C. Habein, Rochester and Dr. W. H. Aurand, Minneapolis, medical section; Dr. J. W. Gamble, Albert Lea and Dr. W. H. Hengstler, Saint Paul, specialties. Dr. F. W. Lynch, Saint Paul, is in charge of local arrangements.

One afternoon will be devoted to medical phases of the national defense program.

The popular Round Table luncheons will be held Monday and Tuesday.

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†Chairman, Minnesota Division, National Physicians' Committee.

*Acting Secretary and Member Board of Trustees, National Physicians' Committee.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

MEDICAL ECONOMICS IN MINNESOTA
1934-1941

After eight years of service to the Committee on Medical Economics as chairman and as editor of this section of MINNESOTA MEDICINE, Dr. W. F. Braasch of Rochester this year resigned his post to devote himself to the heavy and exacting duties of trustee to the American Medical Association. As an officer for many years of the Minnesota State Medical Association and particularly as chairman of this committee, Dr. Braasch has won nation-wide recognition for himself, for the work of the Committee and for Minnesota.

The occasion of his retirement would be one of great regret and great loss to Minnesota if it were not for the fact that he retains membership in the committee and his interest in its work is certain to remain close and loyal. His duties as trustee will keep him in close touch with economic and social developments in medicine all over the country and his advice and assistance will undoubtedly be willingly given to his colleagues in Minnesota.

When the Committee on Medical Economics was formed in 1934 federal relief for the unemployed was new, Social Security was only a phrase and the concept of federal grants-in-aid for health programs in the states was still strange and unfamiliar.

It was evident to forward-looking physicians, even then, that new currents were moving in the United States and that medicine would inevitably be drawn into the main stream of a new government paternalism unless a strong, wise and far-seeing resistance could be set up.

Subsequent years have seen that resistance develop and flourish. And it is due to the work of men like Dr. Braasch of Minnesota that the government still pauses well on this side of an invasion of the private practice of medicine and that its spokesmen are still loud in praise of the fundamental principles for which medicine in America stands—maintenance of high standards for education and practice, freedom from political control for the doctor and freedom of choice for the patient.

It is difficult for any of us to think back clearly, now, to that remote date of 1934. We are separated from it by more than years. The face of the world has changed since then and attention in the United States has shifted over night from social reform to a feverish preparation for the cataclysm of war which may at any time spread from Europe and Asia to the American continents. Wars are not eternal, however, even when they go on for thirty years or even for 100 years. In the end there is a breathing space. But what will be left of the practice of medicine as we know it now in the United States when that breathing space comes?

It is for the American physician to say. Only he is keenly aware of the medical values which may easily be sacrificed with a mere scratch of a defense coördinator's pen in the heat of a national emergency. Only he whose whole heart and mind are bent upon healing can be trusted to cherish and protect the future of scientific medicine in this period of convulsion and attack.

Thanks to our alert profession in Minnesota, to our watchful and farsighted Committee on Public Policy, our fine State Board of Health and to Dr. Braasch and his committee, Minnesota today stands at the top among the states in medical achievement, in the public health, in its relative freedom from quackery in medicine and in the absence of radical and dangerous legislative tampering with the practice of medicine.

To hold the place we have won and to meet the heavy new responsibilities of the future is the task we must assume today. No one committee can do it; but if all of us work together for the common good, the task will be done.

FOR RESERVE OFFICERS IN MINNESOTA

Problems of medical reserve officers are varied and difficult. Official information on what the reserve officer may expect in the way of advance notice before he is called to active duty—about protection on active duty—about possible safeguards for the practice he leaves for the term of that service—is not always easy to secure and sometimes it seems to be contradictory and uncertain.

The following information has been verified by the Committee on Military Affairs and may be relied upon, subject to emergency changes in regulations always possible in view of the unsettled international situation and defense needs at home.

"With or Without Consent"

1. Under the recent joint resolution passed by the 76th Congress, the President is authorized to order into active military service of the United States for a period of twelve consecutive months each, any or all members of any Reserve component of the Army of the United States with or without their consent, to such extent and in such manner as he may deem necessary for the strengthening of the national defense. If a sufficient number of officers do not indicate their availability, reserve officers must necessarily be ordered to duty. The oath of office taken by each member of the Reserve Corps is regarded as binding and will be taken at its face value in lieu of advance notice if the member is needed.

2. Corps area surgeons have been urged by the Surgeon General of the Army and the Committee on Medical Preparedness to avoid, if possible, stripping any community of needed medical service; but military needs come first and it is inevitable that civilian considerations will receive smaller attention.

Urged to Volunteer

To reduce as far as possible the number of reserve officers who must be called without their consent, all interns and residents are being urged to volunteer at once for a year of service. To do so may save them an interruption to their practice later on. Definite arrangements are being worked out whereby some medical school graduates may be assigned to service in a military hospital and this service may count toward certification for an examining board since, within the next three months, about 20,000 additional military hospital beds will be opened and physicians will be needed to man these military hospitals.

3. Reserve officers should forward their physical examination records to Corps Area Headquarters before they are called to active duty. Not a few have been discovered unfit for service after they had left their practices and made extensive arrangements to be absent for a long period of time.

4. The War Department will not accept any resignations from officers in the Reserve Corps who are above the rank of a captain, regardless of reasons, unless specifically authorized by the Secretary of War. Those who are below the rank of captain may resign if they have persons dependent upon them and their resignations may or may not be accepted according to the circumstances and the need.

5. Pay and allowances are presented in the following chart:

PAY AND ALLOWANCES

Grade	Annual Base Pay	Monthly Allowances			
		Rental Allowance		Subsistence Allowance (30 days)	
		With Dependents	Without Dependents	With Dependents	Without Dependents
Colonel	$4,000	$120.00	$80.00	$36.00	$18.00
Lieut. Colonel	3,500	120.00	80.00	54.00	18.00
Major	3,000	100.00	60.00	54.00	18.00
Captain	2,400	80.00	60.00	36.00	18.00
First Lieutenant	2,000	60.00	40.00	36.00	18.00

6. The annual base pay is increased at the rate of five per cent thereof for each three years of service up to thirty years. Full time will be computed for all periods during which men have held commissions as officers in the Army, Navy Marine Corps, Coast Guard, Coast and Geodetic Survey and Public Health Service or in the National Guard, Naval Militia and National Naval Volunteers or the Naval Reserve Force or Marine Reserve Force when confirmed in grade and qualified for all general service and with full time for all periods during which they have performed active duty under Reserve Commissions and with one-half time for all other periods in which they have held Reserve Commissions.

7. The Order to active duty places the recipient on duty immediately upon receipt and he must report on the date set to the post, camp or station for duty. Travel allowance will be made at the rate of eight cents a mile based on the shortest usual railway route to the station. The trip may be made by automobile but no special delay will be granted on that account.

8. Transportation for dependents will not be furnished by the government and reserve officers are warned that the housing problem at or within the vicinity of Army stations is likely to be acute so that it will probably be advisable to leave the family at home. In some cases, families of officers are definitely forbidden to follow them to their posts.

9. Uniforms and military equipment may be purchased at the first station.

In Case of Injury

10. Injury received or disease contracted in line of duty will entitle the reserve officer on active duty, to hospitalization, medical and surgical care and regular pay and allowances up to six months after the prescribed tour of duty and to necessary hospitalization, medical care and subsistence as long as necessary if the injury or illness requires it for a period longer than six months. The same allowances apply to injury incurred in travel to and from the station.

11. In case of death or disability in line of duty when ordered to active duty for a period in excess of 30 days, the reserve officer is entitled to the same pensions, compensations, retirement pay and hospital benefits as a regular army officer of the same grade and length of service.

12. The reserve officer ordered to active duty (except for training) is entitled to all the benefits of the pension laws existing at the time.

Regular Army Appointments

13. Appointments in the Medical Corps of the Regular Army will, in all probability, continue as at present through competitive examinations of reserve officers who have not passed the age of 32 years at the time of appointment.

For medical reserve officers, as for men selected in the draft, the law provides protection against foreclosure on real estate and other civil suits while they are on active duty, against loss of equipment or other articles purchased previously on the installment plan—though the law does not annul the obligation itself—and against eviction for non-payment of rent provided the rental is not more than $80.00 and the premises are used chiefly for a dwelling place for family or dependents. No protection is provided in the law against eviction from premises used for offices, but all reserve officers and any others who may be called to service are advised to make special arrangements, immediately, with landlords looking to their possible absence on duty. Such arrangements have already been made by a number of real estate and rental firms in Minnesota for convenience of physician tenants. In St. Paul, for example, the management of one large building has announced that offices of physicians and dentists called to active duty will be closed and left exactly as they are for a nominal rental, $5.00 a month, for the period of their absence from practice. Similar arrangements can undoubtedly be made elsewhere.

Minnesota Plan

No law can protect against loss of practice, of course, but many state medical associations have developed a variety of plans for keeping intact the practice of members called to active duty. Some of these plans seemed elaborate and unworkable to the Committee on Military Affairs, which studied the matter. A simpler plan was accordingly presented to the Council, at its meeting on December 15, for Minnesota. This plan was approved and is already being put into effect.

It calls for creation of a special list or "pool" of physicians who are not immediately eligible

for military service and who can be sent on locum tenens to act as substitutes for physicians called for military service.

The first step in the program will be a special plea to all reserve officers, regardless of their situation, and even if they have already asked for deferment, to make all possible preparations now for a call to duty.

The need for medical officers is acute. No requests for deferment will be heeded by the War Department unless they are given for grave reasons. The reserve officer may be called with very short notice or no notice at all if the need is urgent.

For those who are unable to make their own arrangements the list to be created by the Association will fill the gap.

To procure the names for this list a canvass of the entire Association is already under way. Letters have been sent to every member, to interns, residents and fellows and to all affiliate members of the Association urging all who are willing to accept a locum tenens under these circumstances to send their names immediately to the State Office.

Contract to Be Drawn

For many young men just entering practice and for many older men who are retiring from active practice this "pool" of names may afford a welcome opportunity for service.

A contract will be drawn up with the advice of the legal counsel of the Association to protect the interests of both, in case a man is sent from the "pool" to substitute for a medical officer called to duty.

For Relief from Dues

The question of whether dues of members going into the service should be remitted was also discussed at length by the Council at the December meeting. It was generally agreed by the Councilors that no members could be relieved entirely of the obligation of paying dues to the state society for two reasons: first, the constitution and by-laws of the Association make no provision whatever for retaining members on that basis; second, heavy drains are anticipated on the state budget and funds could not be spared for the purpose, even if the time-consuming process of changing the by-laws were undertaken, this year.

It was suggested, however, that members who remain in practice at home will almost inevitably benefit to some extent from the absence of men in service and they will undoubtedly be glad to pay the dues of absent colleagues as their contribution to defense.

Meetings to Be Called

Indeed, it was reported that some societies have already decided to pay both local and state society dues for their members on active duty out of society funds.

At the direction of the Council, therefore, a letter has already gone to all officers of local and district medical societies asking them to call a special meeting of their societies to act upon this matter. In smaller societies where funds are limited, it was suggested that members might be assessed for the amount necessary to pay these dues.

The number of reserve officers so far called is relatively small and, though more will be called before July 1, the amount of money required from each society will not, it is believed, be excessive.

Membership Important

Many reserve officers, particularly those holding commissions in the higher grades, will not need or desire relief from payment of medical society dues. All, however, will want to retain membership, not only to maintain their own position at home and the position of their organization, but also to enjoy privileges of membership wherever they may be stationed. It is also an established fact that the War Department attaches great weight to medical society membership and takes it into account in making all appointments and promotions in the medical services.

NEW YEAR'S RESOLUTION

(Monthly Editorial Prepared by the Medical Advisory Committee)

With the advent of 1941 your Medical Advisory Committee is impelled again to put before you clearly the importance of keeping accurate records. There is no single item more important in defense of an unjust malpractice suit than a well-kept clinical record. Whether treatment is carried on in the office, or in the hospital, it is your important duty to put in writing the treat-

ment administered, and the advice given to the patient. Particularly important is a notation, in your own handwriting, of the directions you give a fracture care, or a post-operative case, when it leaves your immediate care.

A careful notation as to the condition of the specific ailment, when the patient leaves your hands, may save embarrassment and trouble later. You are busy. You cannot be expected to remember the details of any individual case, and if you are called upon suddenly to defend yourself in a malpractice suit a well-kept clinical record, including dates, will prove a great help.

In hospital cases be sure to have a notation on the chart, in your own handwriting, if there is any unusual occurrence. If a patient falls out of bed; if there is a complaint about a hot water bottle; if there is a minor infection of some kind, and if there is any evidence at any time of anything other than the expected course of events, make a note of it, with the date, on the Progress Record of the hospital chart.

When the patient leaves the hospital make a notation, in your own handwriting, of the condition on discharge, and the instructions given. Do this yourself; do not rely upon the intern or the house physician to do it for you. This will save time and trouble as to identification of the record if it ever has to be taken into Court.

Your Advisory Committee is not pessimistic. It believes that medicine and surgery, as practiced in Minnesota today, are of the highest type. Unfortunately, however, no one of us is immune to unjust malpractice suits, and, therefore, it behooves all of us to keep accurate and complete records, which may be of inestimable help in time of trouble.

Let this be an important New Year's Resolution for 1941!

W.H.H.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Former Minneapolis Chiropodist Pleads Guilty to Practicing Healing Without a Basic Science Certificate

Re: State of Minnesota vs. Clayton E. May.
Re: State of Minnesota vs. Otto A. Burger

On December 6, 1940, Otto A. Burger, fifty-five years of age, entered a plea of guilty before Judge Luther W. Youngdahl of the District Court of Hennepin County, to an information charging him with the crime of practicing healing without a Basic Science Certificate. Burger was sentenced to a term of 3 months in the Minneapolis Workhouse, which sentence was stayed for a period of one year upon condition that Burger return to the State of California, where he was living at the time of his arrest. Burger was indicted jointly with Dr. Clayton E. May by the Grand Jury of Hennepin County on April 27, 1937, charged with manslaughter in the first degree following the death of a 25 year old married woman on whom, it was alleged, a criminal abortion had been performed. The authorities were unable to apprehend either defendant at the time. However, in 1938, the defendant May was arrested in San Francisco, California, charged with murder in the second degree following an alleged abortion on a married woman. May was convicted at San Fancisco, and on October 29, 1938, was sentenced to a term of 5 years to life for that crime. Burger was apprehended in California in the summer of 1940, and returned to Minneapolis for trial. The facts in the case indicate, however, that the abortion was actually performed by the defendant May and that Burger acted simply as a go-between, and made the arrangements for the criminal abortion, and suggested certain medication for the deceased.

Burger was a licensed chiropodist in Minnesota from 1917 to 1936, at which time his chiropody license was revoked for non-payment of the annual registration fee. Burger has never been licensed in Minnesota as a physician although he attempted, without success in 1927, to secure a Basic Science Certificate by exemption, claiming at that time, that he was a naturopath. The defendant May was formerly licensed to practice medicine in Minnesota. On May 23, 1934, he was convicted in Federal Court in St. Paul of "conspiring to harbor and conceal a fugitive from justice, the said fugitive being one John Dillinger." For this Dr. May was sentenced to two years in the Federal Penitentiary at Leavenworth. On February 9, 1935, Dr. May's license to practice medicine in the State of Minnesota was revoked.

License of Minneapolis Physician Suspended for Three Years

In the matter of the revocation of the license of Lewis Van Deboget, M.D.

On December 12, 1940, the Minnesota State Board of Medical Examiners suspended, for 3 years, the license to practice medicine held by Lewis Van Deboget, M.D., of Minneapolis. Dr. Van Deboget was charged with having procured, aided and abetted a criminal abortion upon a married woman. At the hearing, Dr. Van Deboget denied the charge, but a statement signed by Dr. Van Deboget on July 1, 1940, at the time of his arrest, was introduced in evidence. In this statement Dr. Van Deboget admitted that he had been paid $50.00 by the husband of the woman, and upon being asked what method he used to induce the woman to abort, he stated:

"I painted the womb with iodine—the outside of the neck of the womb."

The statement also showed that upon being asked why he painted the womb with iodine, Dr. Van Deboget replied:

"It would cause the womb to contract and cause it to expel anything that was in it."

Evidence was also introduced at the hearing indicating that Dr. Van Deboget had performed other abortions. Dr. Van Deboget's case was submitted to the grand jury of Hennepin County in July, 1940, but the grand jury did not indict him.

Dr. Van Deboget's license was suspended on a previous occasion for a period of 3 months because of the issuance of over 4,000 non-bona fide medical prescriptions calling for alcohol, whiskey and other alcoholic beverages. This suspension occurred on July 6, 1938.

Dr. Van Deboget was born at Grass Lake, Michigan,

in 1874, and graduated from Hamline University in 1909. He was licensed to practice medicine in Minnesota by examination in the same year. Until recently Dr. Van Deboget's office was at 1032 2nd Ave. S., Minneapolis.

License of International Falls Physician Suspended for Five Years for Drug Addiction

In the matter of the revocation of the license of Robert F. Werner, M.D.

The medical license of Dr. Robert F. Werner of International Falls, Minnesota, was suspended for five years on December 12, 1940, by the Minnesota State Board of Medical Examiners. Dr. Werner's license was suspended because of his habitual indulgence in the use of narcotic drugs.

A joint investigation of Dr. Werner's activities, conducted by the Federal Bureau of Narcotics, and the Minnesota State Board of Medical Examiners, disclosed that between June 8, 1938, and June 8, 1940, Dr. Werner had purchased an excessive amount of narcotic drugs. Notwithstanding an unusually large dispensing record, Dr. Werner had a large shortage. He finally admitted that he had diverted a portion of his supply of morphine to his own personal use, which average from 3 to 6 grains daily. Dr. Werner's narcotic record for the period of June 8, 1938, to June 8, 1940, is as follows:

Drug	Bought	Disp.	On Hand	Shortage
M. S. ¼ gr.	12000	4260	53	7687 — (¼)
M. S. ⅙ gr.	10900	4970		5930 — (⅙)
M. S. ⅛ gr.	7100	2840		4260 — (⅛)
M. S. with atrop. ¼ gr.	360	318		42 — (¼)
Cod. ¼ gr.	4300	4028		272 — (¼)
Cod. ½ gr.	2100	1874		226 — (½)
	36760	18290	53	18417 (Tab.) 3634 (Gr.)

Dr. Werner's record also showed that between July 8, 1934, and November 14, 1936, he was a voluntary patient on 4 occasions at the Willmar State Hospital. Dr. Werner's hospitalization on those occasions was due to excessive indulgence in alcoholic beverages. Dr. Werner was born on April 4, 1901, at Center City, Minnesota. He was graduated in Medicine from the University of Minnesota in 1926, and was licensed in Minnesota by examination the same year.

Minneapolis Physician's Plea for Pardon Denied

Re: State of Minnesota vs. William M. Chowning, M.D.

On November 29, 1930, the Minnesota State Board of Pardons denied a pardon to Dr. William M. Chowning of Minneapolis. Dr. Chowning was convicted on April 24, 1936, by a jury in the District Court of Hennepin County of the crime of abortion. On November 7, 1936, his license to practice medicine was revoked by the Minnesota State Board of Medical Examiners.

The State Board of Pardons conducted a full hearing in the matter on July 29, 1940, and subsequently thereto. At the hearing before the Pardon Board Mr. L. J. Lauerman of Olivia, Minnesota, representing Dr. Chowning, stated that Dr. Chowning "was framed." Mr. Lauerman, claimed that Dr. Chowning's trouble arose out of his testifying in malpractice suits against members of the American Medical Association and the Minnesota State Medical Association. Dr. Chowning's pardon application was opposed by the Minnesota State Board of Medical Examiners for the reason that the facts in Dr. Chowning's case show that he was indicted by the grand jury of Hennepin County for the crime of abortion and subsequently tried and convicted by a jury in the Court of Judge Montgomery. The records of the Minnesota State Board of Medical Examiners show that Dr. Chowning's license was revoked because of his conviction of a felony, the felony being the crime of abortion.

The members of the Minnesota State Board of Pardons are: Governor Harold E. Stassen, Chief Justice Henry M. Gallagher of the Supreme Court of Minnesota, and Attorney General J. A. A. Burnquist.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS ON NOVEMBER 8, 1940

October Examination

Aita, John Andrew—U. of Iowa, M.D. 1937, Rochester.

Albers, George Donald—U. of Mich., M.D. 1939, Rochester.

Anderson, Charles Duncan—U. of Western Ont., M.D. 1939, Rochester.

Anderson, Earl Melvin—U. of Minn., M.B. 1940, Minneapolis.

Arling, Philip Arthur—U. of Minn., M.B. 1940, Saint Paul.

Bratholdt, James Wollard—U. of Minn., M.B. 1938; M.D. 1939, Minneapolis.

Brown, Murray Hunter—Yale U., M.D. 1938, Rochester.

Brown, Schuyler Pillsbury—U. of Minn., M.B. 1940, Minneapolis.

Burnham, Wesley Howard—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.

Carryer, Haddon McCutcheon—Northwestern, M.B. 1938; M.D. 1939, Rochester.

Catinella, Paul Joseph—Tufts Univ., M.D. 1936, Rochester.

Dahlstrom, Doris Elizabeth—U. of Minn., M.B. 1939, Minneapolis.

Davies, Louis Tookey—U. of Neb., M.D. 1939, Rochester.

Ehni, George John—Northwestern, M.B. 1939; M.D. 1940, Rochester.

Fenstermacher, Richard Henry—Jefferson Med. Col., M.D. 1937, Rochester.

Geissler, Gerald George—U. of Minn., M.B. 1939; M.D. 1940, Hinckley.

Glomset, Daniel Anders—U. of Chicago, M.D. 1938, Rochester.

Hallenbeck, George Aaron—Northwestern, M.B. 1939; M.D. 1940, Rochester.

Hartig, Marjorie Eunice—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.

Higginson, John Francis—Columbia P. & S., M.D. 1937, Rochester.

Honke, Richard Wunnibald—Creighton U., M.D. 1938, Proctor.

Iverson, Rolf Marshall—Northwestern, M.B. 1937; M.D. 1939, Rochester.

Janssen, Martin Ernest—Rush Med. Col., M.D., 1939, Saint Paul.

Judd, David Berkman—U. of Minn., M.B. 1939; M.D. 1940, Rochester.

Kelly, John Francis—U. of Minn., M.B. 1940, Saint Paul.

Leveroos, Edward Herbert—U. of Minn., M.B. 1940; M.D. 1940, Superior, Wis.

Lofsness, Stanley Vincent—U. of Minn., M.B. 1938; M.D. 1939, Minneapolis.

Luckey, Clarence Andrew—U. of Neb., M.D. 1939, Rochester.

Lyman, Richard Watson—U. of Ore., M.D. 1939, Rochester.

Nelson, Clayton Everett Jonas—U. of Minn., M.B. 1940, Saint Paul.

Olson, Stanley William—U. of Ill., M.D. 1939, Rochester.

(Continued on Page 51)

OF GENERAL INTEREST

Dr. and Mrs. Charles E. Rea of Saint Paul announce the birth of a daughter, Mary Virginia, November 20.

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A son, Michael, was born to Dr. and Mrs. William A. O'Brien of Minneapolis, December 1.

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Dr. and Mrs. Francis Lynch are the parents of a daughter, Mary Adeline, born December 11.

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A daughter was born to Dr. and Mrs. Ralph Rossen of Hastings, December 10. She has been named Fredericka.

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Dr. E. A. Thayer of Truman announces the opening of a hospital there. The hospital, a remodeled and modernized residence, has eight beds and three bassinets.

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The marriage of Dr. A. L. Vadheim of Tyler and Mrs. Gladys Donovan took place in Tyler, November 13.

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Dr. George E. Fahr, professor of medicine at the University of Minnesota Medical School, is recuperating after an appendectomy.

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Twin daughters were born to Dr. and Mrs. Alex A. Kugler of Saint Paul, November 27. They have been named Margaret Elizabeth and Patricia Ann.

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Dr. Maud M. Gerdes is now full-time Director of Maternal and Child Health of the Mississippi State Board of Health at Jackson, Mississippi.

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Dedication of a new addition to St. Olaf Hospital in Austin, Minnesota, took place December 1. The 45-bed addition gives Austin a 105-bed hospital.

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Dr. and Mrs. Wallace P. Ritchie of Saint Paul have returned from a month's vacation trip in southern California.

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Dr. R. D. Hanover of Littlefork has taken over the practice of Dr. David M. Potek at International Falls, the latter having been called for active duty in the United States Army.

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Dr. and Mrs. A. E. Benjamin of Minneapolis spent the Christmas holidays in Miami, Florida. They were accompanied by their daughter, Alice, who teaches at Hillsdale School in Cincinnati, Ohio.

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Dr. H. B. Macey and Dr. H. Waltman Walters of Rochester attended a meeting of the Southern Surigcal Association in Hot Springs, Virginia, December 10, 11 and 12.

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Dr. Viktor O. Wilson of the Minnesota State Department of Health will address the Women's Auxiliary of the Minnesota State Dental Association at its annual meeting in February.

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Dr. Arthur C. Skjold is the newly elected president of the Minneapolis Pistol and Revolver Club. Dr. Skjold held the Minnesota civilian pistol championship in 1936.

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Dr. William R. Bagley of Duluth was elected a member of the board of the Minnesota chapter, Izaak Walton League, at its annual convention in Minneapolis which closed December 13.

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Recently elected chiefs of staff of Minneapolis hospitals are: Dr. Duma Carroll Arnold, Asbury Hospital; Dr. Walter Edward Camp, Northwestern Hospital; Dr. Carl Ragnar Wall, Deaconess Hospital.

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Dr. L. A. Nash, who recently completed his fellowship in radiology in the Mayo Foundation at Rochester, is now radiologist at St. John's Hospital in Fargo, North Dakota.

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Drs. M. O. Henry and E. T. Evans of Minneapolis entertained the Minnesota-Dakota Orthopedic Club at a banquet at the Minneapolis Club, December 20, for Dr. Wallace Cole of Saint Paul, who is leaving shortly to take charge of the American Hospital in Britain.

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Dr. Leo G. Rigler, professor of radiology at the University of Minnesota, was toastmaster for the annual banquet of the Twin City Society of X-Ray Technicians, held December 14 at the Curtis Hotel in Minneapolis.

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Dr. M. J. Lindahl has moved into his new hospital-residence in Sherburn. Of colonial style architecture, the building has eleven rooms on the first floor, including living quarters and consultation rooms. It is 77 by 34 feet.

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Among medical courses to be held at the Center for Continuation Study is one in Hospital Administration, January 27 to February 1. Dr. Arthur C. Bachmeyer, director of University Clinics at the University of Chicago, will participate.

* * *

Dr. William B. Castle of Boston, professor of medicine at Harvard Medical School, will participate in the course in Internal Medicine to be given at the Center for Continuation Study on the University of Minnesota campus, March 3-5.

* * *

In Chicago, November 30, for a meeting of the Travel Club of the Central Association of Obstetricians and Gynecologists were Dr. L. M. Randall and Dr. A. B. Hunt of Rochester, and Dr. Claude J. Ehrenberg and Dr. John L. McKelvey of Minneapolis.

Dr. Harold O. Peterson, instructor in radiology at the University of Minnesota Medical School, has entered into practice with Dr. John P. Medelman and Dr. Edward Schons, 572 Lowry Medical Arts Building, Saint Paul.

* * *

Dr. Evelyn Johnson of the Human Serum Laboratory at the University of Minnesota has opened offices in St. Louis Park for the practice of pediatrics. She will continue as clinical instructor in the Department of Pediatrics.

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Dr. C. D. Creevy, assistant dean of the University of Minnesota Medical School, addressed the meeting of the New York Academy of Medicine in New York City, December 18. His subject was "Urinary Calculi Produced by Bacillus Proteus."

* * *

Dr. Charles G. Sutherland of Rochester was elected librarian of the Radiological Society of North America at the organization's meeting in Cleveland. Attending from Minneapolis were Drs. Annette Stenstrom, Leo G. Rigler and C. N. Borman.

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Dr. M. H. Manson, one-time member of the Department of Surgery at the University of Minnesota Medical School and son of Dr. Frank M. Manson of Worthington, became medical director of Bell Telephone Laboratories in New York, November 1.

* * *

Dr. J. Y. Feinstein of Cambridge has opened offices in Grove City, Minnesota. For the past two years, Dr. Feinstein has been senior physician at the State Hospital in Cambridge, and previous to that he practiced at Minot, North Dakota.

* * *

Dr. E. J. Nelson was elected president of the City Hospital staff at Owatonna at a recent meeting. Dr. J. F. Schaefer of Owatonna showed surgical motion pictures prepared by the Northwestern University Medical School.

* * *

Professor R. G. Gustavson, chairman of the Department of Chemistry at the University of Colorado, lectured at the University of Minnesota Medical School, December 12, under the auspices of the Division of Physiological Chemistry. His subject was "The effects of the Synthetic Estrogens Upon the Thyroid Gland."

* * *

Dr. F. Norman Pansch announces the opening of offices for the practice of obstetrics and gynecology in Appleton, Wisconsin. Dr. Pansch interned at Ancker Hospital in Saint Paul in 1936-37, and held a fellowship in obstetrics and gynecology at the Mayo Foundation, 1937-40.

* * *

The University of Minnesota board of regents has accepted a gift of $1,240 from the National Foundation for Infantile Paralysis to be used for a six-months course in orthopedic nursing, beginning with the winter quarter.

Among medical officers of the United States Naval Reserve who are under orders for active duty are:

Lieutenant Frederic F. Wipperman of Minneapolis, to Naval Reserve Air Base, Minneapolis.

Lieutenant Herbert H. Schneider of Rochester, to Naval Hospital, Pensacola, Florida.

* * *

Dr. F. H. Krusen of Rochester represented the Council on Physical Therapy of the American Medical Association at a meeting of the Federal Communication Commission in Washington, D. C., November 29. The meeting was concerned with radio interference by electromedical apparatus.

* * *

Dr. R. H. Beiswanger, physician in Wykoff for eleven years, has disposed of his practice to Dr. Richard Herbst, a recent graduate of the medical school of the University of Minnesota. Dr. Beiswanger with his family has moved to St. Louis Park, and will take a three-year fellowship at the University of Minnesota in roentgenology.

* * *

Dr. Harold S. Diehl, as a member of the Council on Medical Education and Hospitals of the American Medical Association, participated in a survey of the Louisiana State University Medical School in New Orleans recently. Others who took part were Dr. William Cutter of Chicago, secretary of the council, and Dr. Herman Weiskotten, dean of the Syracuse University Medical School.

* * *

Dr. J. A. Williams, who recently completed an internship at St. Mary's Hospital in Duluth, is assistant to Dr. E. K. Rowles at the Rood Hospital in Coleraine. Dr. Williams replaces Dr. A. C. Kelly, who recently took over the practice of Dr. Roy Mayne of Duluth. Dr. Mayne, a medical reserve officer, was called to active duty in the United States Navy.

* * *

Dr. Henry E. Michelson, director of the division of dermatology at the University of Minnesota Medical School, has been invited to give the addresses in dermatology and syphilology at the three-day Post-Graduate Clinics of St. Louis, Missouri, March 11, 12 and 13. The clinics are being sponsored by the St. Louis Medical Society.

* * *

Dr. J. P. Person of Giltner, Nebraska, has become associated in practice with Dr. S. A. Whitson and Dr. Donald Stark Branham in Alden.

Dr. Person began his practice in Alden, November 29, and four days later was elected president of the Civic League at Alden. He succeeds Dr. Whitson, who asked to be retired from the presidency which he has held for a number of years.

* * *

Dr. D. C. Lochead, deputy city health officer at Rochester for sixteen years, has resigned, effective April 14, 1941, and Dr. Floyd M. Feldman, director of rural health of District 3 of the Minnesota State Board of Health with headquarters in Rochester, has been appointed part-time deputy, effective January 1. Dr. Feldman, a graduate of the University of Minne-

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sota Medical School, was formerly associated with the hospital for Indians at Red Lake.

* * *

Sponsored by the Hennepin County Medical Society and the Minneapolis Surgical Society, the second annual fracture symposium will be presented at the Minneapolis General Hospital and the Society Auditorium, January 6.

Dr. Fraser Baillie Gurd, surgeon with the Canadian Expeditionary Force in the first World War and attending surgeon at the Montreal General Hospital, will be the principal speaker. His subject will be "Treatment of Gunshot Wounds."

* * *

Dr. Karl H. Pfuetze, who has been assistant to Dr. W. D. Beadie at the Mineral Springs Sanatorium for the past few months, has been appointed superintendent of the Sanatorium to succeed Dr. Beadie who recently resigned because of ill health.

Dr. Pfuetze's appointment was effective December 4. Before coming to Mineral Springs, Dr. Pfuetze was assistant at the Nopeming Sanatorium.

Dr. and Mrs. Beadie have gone to Windom to make their home.

* * *

Attending the meeting of the American Academy of Dermatology and Syphilology in Chicago, December 8-11, were Drs. P. A. O'Leary, L. A. Brunsting and Hamilton Montgomery of Rochester, and Drs. H. E. Michelson and L. H. Winer of Minneapolis.

Dr. Montgomery was chairman of the dermatopathology roundtable. Dr. Michelson, as a member of the American Board of Dermatology and Syphilology, spent the week prior to the session assisting in examination of candidates.

* * *

The Minnesota Society for the Control of Cancer filed articles of incorporation, December 12.

Dr. William A. O'Brien of Saint Paul is president of the society; Dr. Max W. Alberts of Saint Paul, vice president; Mrs. S. L. Carr of Minneapolis, secretary; Louis W. Hill, Jr., of Saint Paul, treasurer.

Other members of the board are Dr. Charles W. Mayo of Rochester; Dr. Guy Stanton Ford, president of the University of Minnesota; Mrs. Howard Overman of Saint Paul and Mrs. Harlow Hanson of Minneapolis.

* * *

Dr. Russell M. Wilder of Rochester has been named chairman of a national committee to study nutritional aspects of national defense. This new committee on food and nutrition was set up by the National Research Council.

In accepting the chairmanship, Dr. Wilder relinquished the chairmanship of the committee on medicine and the subcommittee on nutrition to which he was appointed last summer.

Dr. Wilder attended an organization meeting of the new committee in Washington, D. C., early in December.

Organization of a general hospital unit for service in any theater of operations in the event of war is being sponsored by the Mayo Clinic and the Mayo Foundation. The unit will be known as the 71st General Hospital Unit. It is one of 102 units authorized by the war department, and is the second to be organized in the state, the University of Minnesota sponsoring the other unit. In the first World War, the Mayo Clinic and the Mayo Foundation coöperated with the University of Minnesota Medical School in the organizing of Base Hospital 26.

* * *

Inoculation of 800 University of Minnesota students with a newly developed influenza vaccine was begun December 11, in an effort to test effectiveness of the serum if an epidemic now on the West Coast spreads to Minneapolis.

A limited supply of the vaccine was obtained from the Minnesota State Board of Health which is cooperating with the Rockefeller Institute for Medical Research in testing the vaccine. Similar tests are also being carried on in other cities.

Inoculations were begun in December, according to Dr. Donald Cowan who is assistant to Dr. Ruth Boynton, director of the Student Health Service, because it has not been determined how soon the vaccine becomes effective, and because it can be tested only during an epidemic.

* * *

Enlargement of the field of scientific research was urged by Dr. Guy Stanton Ford, president of the University of Minnesota, in his biennial message to the board of regents, December 13. The report was the last he will deliver, for he retires in June after twenty-eight years in leading administrative posts on the campus.

Pointing out that American industry invests $300,000,000 annually in medical research alone, Dr. Ford urged support of research in the university.

"With all appreciation of the friendly understanding of the last legislature," he said, "I have never been able to follow why the modest and inadequate sum granted for research in our medical school was reduced.

"The $5,00 thus saved, if 'saved' is the word to use, would have enabled a specially competent group to make a beginning on a perhaps long-time campaign against such heart-rending disease as epilepsy, or on other diseases from which we now only pray that chance will deliver us and our children.

"When similar diseases invade our fields or our herds, we bestir ourselves mightily."

* * *

A portrait of Dr. Jennings C. Litzenberg of Minneapolis, University of Minnesota professor emeritus and for many years head of the obstetrics and gynecology department at the University Medical School, was unveiled at a dinner at the Minneapolis Club, December 19, and was presented to Dr. Guy Stanton Ford, president, who received the gift for the University. The portrait was painted by Edward Brewer of Saint Paul.

Guests included a group of men who received their

Ph.D. degrees at the University under Dr. Litzenberg: Drs. Roy E. Swanson, S. B. Solhaug, L. A. Lang, M. Abramson, E. C. Maeder of Minneapolis and Drs. L. W. Barry and E. M. Kasper of Saint Paul.

Department heads of the Medical School who were among the guests were: Dr. Harold S. Diehl, dean of medical sciences; Dr. J. L. McKelvey, head of obstetrics and gynecology; Dr. Frank Burch, ophthalmology and otolaryngology; Dr. Irvine McQuarrie, pediatrics; Dr. Owen Wangensteen, surgery.

Fred B. Snyder represented the board of regents. Other guests include Dr. Robert Mussey of Rochester, and Dr. Russell Morse, president of the Hennepin County Medical Association.

* * *

In addition to those listed in the December issue of MINNESOTA MEDICINE the following medical reserve officers in the United States Army have been called to active duty:

Dr. John H. Grindlay of Rochester, first lieutenant, to Randolph Field, Texas.
Dr. F. P. Arny of Preston.
Dr. J. A. Mason of International Falls, first lieutenant, assigned to Camp Joseph T. Robinson at Little Rock, Arkansas.
Dr. John Johnson of Kerkhoven.
Dr. D. M. Potek of International Falls, first lieutenant.
Dr. C. G. Wingquist of Crosby, captain.
Dr. Luverne J. Webster of Battle Lake, head of Otter Tail County Sanatorium, assigned to Camp Joseph T. Robinson at Little Rock, Arkansas.
Dr. Leo Francis Bach of Mapleton, captain.
Dr. Edward Bruce Badger of Minneapolis, captain.
Dr. Robert Jacob Brotchner of Saint Paul, first lieutenant.
Dr. Albert Sinai Brussell of Saint Paul, captain.
Dr. Henry B. Clark, Jr., of Saint Paul, captain, assigned to Camp Joseph T. Robinson.
Dr. Maurice F. Ekstrom of Saint Paul, first lieutenant, assigned to Camp Joseph T. Robinson.
Dr. Harry Samuel Friedman of Minneapolis, first lieutenant.
Dr. William C. Hartland of Crosby, captain.
Dr. Jack Hartman of Minneapolis, first lieutenant.
Dr. Paul Kisner of Fort Snelling, captain.
Dr. Carl John Lind, Jr., of Minneapolis, captain.
Dr. Joseph Francis Melancon of Saint Paul, first lieutenant.
Dr. Joseph C. Olson, Jr., of Saint Paul, first lieutenant, assigned to Camp Joseph T. Robinson.
Dr. Sidney S. Scherling of Taylor Falls, captain, assigned to Camp Joseph T. Robinson.
Dr. James M. Brown of Caledonia, first lieutenant, assigned to Camp Joseph T. Robinson.
Dr. Wayne S. Hagen of Minneapolis, captain, assigned to Camp Grant, Illinois.

* * *

A large number of Minnesota men were in attendance at the fiftieth anniversary meeting of the Western Surgical Association, which was held December 6 and 7 in Topeka, Kansas, the city in which the association was founded.

The Association voted to hold its 1941 meeting in Saint Paul next December.

Among those who participated in the program at the Topeka session were Dr. S. W. Harrington and Dr. H. Waltman Walters of Rochester. The latter's subject was "Malignant Lesions of the Stomach; Results of Treatment from 1907 through 1938."

Dr. Harry B. Zimmerman of Saint Paul was elected recorder.

Among those elected to membership in the Association were Dr. Wallace P. Ritchie of Saint Paul, and Dr. J. T. Priestley of Rochester.

Attending the meeting besides Drs. Harrington, Walters and Zimmerman, were: Drs. Harry P. Ritchie, Robert Earl, E. Mendelssohn Jones, and N. Logan Leven of Saint Paul; Drs. A. E. Benjamin, William T. Peyton, Arthur C. Strachauer, O. J. Campbell, Martin Nordland, Roscoe C. Webb, S. R. Maxeiner and T. J. Kinsella of Minneapolis; Drs. William Dean Coventry and A. L. McDonald of Duluth; and Drs. A. W. Adson, C. F. Dixon, V. S. Counseller, and W. McK. Craig of Rochester.

LIST OF PHYSICIANS LICENSED

(Continued from Page 47)

Pender, John William—Tulane U., M.D. 1935, Rochester.

Petit, Julian Victor—U. of Minn., M.B. 1940, Minneapolis.

Petkevich, Frank Michael—U. of Chicago, M.D. 1937, Minneapolis.

Pleissner, Karl William—U. of Minn., M.B. 1940, Minneapolis.

Ponterio, James Edmund—Creighton U., M.D. 1940, Saint Paul.

Potter, Robert Tippett—U. of Minn., M.B. 1939, Minneapolis.

Pratt, Joseph Hyde, Jr.—Harvard U., M.D. 1937, Rochester.

Pruitt, Raymond Donald—U. of Kansas, M.D. 1939, Rochester.

Rogers, George Edward Brien—U. of Toronto, M.D. 1938, Minneapolis.

Rushmer, Robert Frazer—Rush Med. Col., M.D. 1939, Rochester.

Schulze, William Matthew—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis.

Schwyzer, Arnold Gustav—Johns Hopkins U., M.D. 1939, Saint Paul.

Sluder, Fletcher Sumpter, Jr.—Rush Med. Col., M.D. 1938, Rochester.

Smith, Frank Baker—McGill Univ., M.D. 1937, Rochester.

Strough, LaVern Craig—U. of Neb., M.D. 1939, Minneapolis.

Sutton, Janet Beth—U. of Minn., M.B. 1939, Minneapolis.

Wise, Ralph Waldo Emerson—U. of Iowa, M.D. 1939, Rochester.

By Reciprocity

Blum, Otto Schidler—U. of Wis., M.D. 1929, La Crosse, Wis.

Chesley, Ward Bennett—U. of Mich., M.D. 1937, Virginia.

Galloway, John D. Brown—Temple U., M.D. 1934, Minneapolis.

Hausmann, Paul Frederic—Northwestern, M.B. 1938; M.D. 1939, Rochester.

Mulmed, Earl I.—U. of Okla., M.D. 1937, Rochester.

Nielsen, Ariel Elias—U. of Louisville, M.D. 1936, Douglas, Wyo.

Noble, Philip Cornelius—Rush Med. Co., M.D. 1929, Minneapolis.

Patch, Orien Bailey—Western Reserve, M.D. 1935, Duluth.

Person, John Paul—U. of Neb., M.D. 1934, Alden.

Rosenbaum, Edward E.—U. of Neb., M.D. 1938, Rochester.

Rosenberg, Charles Freelan—U. of Wis., M.D. 1936, Madison, Wis.

Zeman, Edward William—U. of Neb., M.D. 1936, Omaha, Neb.

National Board Credentials

Boyd, Edith—Johns Hopkins, M.D. 1921, Minneapolis.

Flannary, Hubert Farber—Rush Med. Col., M.D. 1939, Saint Cloud.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR JANUARY

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

The program for the month will be as follows:

January 4—Common Cold.
January 11—Influenza.
January 18—Pneumonia.
January 25—Exodontia.

ANNUAL FORUM ON ALLERGY

The third annual Forum on Allergy will take place Saturday and Sunday, January 11 and 12, 1941, at Indianapolis, Indiana. The intensive program condensed to fill one week-end is the result of suggestions on the part of those who attended the last meeting in Chicago in January, 1940. Of the physicians who attended last year's meeting 146 have signed up for this year's week-end. Both clinicians and those in attendance come from every part of the country. The topics to be discussed will be of interest to internists, pediatricians, dermatologists, otolaryngologists, and all engaged in the practice of medicine.

Registrations should be mailed in advance to Dr. Toll Nelson, 636 Church Street, Evanston, Illinois.

E. STARR JUDD LECTURE

The eighth annual E. Starr Judd lecture at the University of Minnesota will be delivered by Dr. Andrew C. Ivy, professor of physiology and pharmacology at Northwestern University Medical School, January 15. His subject will be "The Mechanism of Gastric Secretion."

MINNESOTA PATHOLOGICAL SOCIETY

Dr. W. M. Stanley of the Rockefeller Institute for Medical Research, Department of Animal and Plant Pathology, Princeton, New Jersey, will address members of the Minnesota Pathological Society, January 21. He will speak on "Some Chemical, Medical and Philosophical Aspects of Viruses."

PHYSICAL THERAPY COURSE FOR TECHNICIANS

The Medical School of the University of Minnesota will inaugurate a course for the training of technicians in Physical Therapy beginning with the Summer Session of 1941. This is a twelve-month course open to graduate nurses, graduates in physical education and graduate medical technicians. The curriculum will cover the entire field of Physical Therapy with abundant clinical training in affiliated hospitals.

Since there is a shortage of well-trained physical therapy technicians in the United States, this course offers excellent training in a field which is rapidly developing and is still full of opportunities. It is believed that in the event of war the army hospitals will require more technicians than are registered in the entire country at the present time.

MINNESOTA STATE SANITARY CONFERENCE

Dr. D. C. Lochead of Rochester was elected president of the Minnesota State Sanitary Conference at a meeting in Minneapolis, November 29. Dr. A. J. Chesley of Saint Paul was reëlected secretary-treasurer, and Dr. C. N. Harris of Hibbing was named vice president. New directors elected to serve until 1943 are Dr. A. T. Laird, of Nopeming, Dr. G. H. Luedtke of Fairmont and Dr. J. P. Wilkins of Mound.

Dr. J. Lawrence McLeod of Grand Rapids is a new member of the Legislative Committee.

Physicians on the conference program included: Dr. T. B. Magath, Rochester health officer and vice president of the state board of health; Dr. O. O. Larsen of Detroit Lakes, who served as president of the conference during the past year; Drs. L. W. Foker and L. S. Arling, State Medical Association Committee; Dr. F. M. Feldman of Rural Health District 3; Dr. J. F. Worley, U.S.P.H.S., director of the Indian Medical Service; Dr. R. R. Sullivan and Dr. Hilbert Mark of the Minnesota State Department of Health; Dr. H. S. Diehl of the University of Minnesota; Dr. L. L. Sogge, chairman of the Public Policy Committee of the State Medical Association; Dr. A. T. Laird, superintendent of Nopeming Sanatorium; Dr. L. J. Webster, superintendent of the Otter Tail County Sanatorium; Colonel Kent Nelson, M.C., United States Army.

RICE COUNTY MEDICAL SOCIETY

Dr. C. Dexter Lufkin of Northfield was elected president of the Rice County Medical Society at the annual meeting in Faribault recently. Other officers elected are Dr. Carl A. Traeger of Faribault, vice president, and Dr. Paul Weaver of Faribault, secretary-treasurer.

NICOLLET-LE SUEUR MEDICAL SOCIETY

Dr. J. F. Traxler of Henderson was elected president of the Nicollet-LeSueur Medical Society at the organization's annual meeting in St. Peter. He succeeds Dr. Burton Grimes of St. Peter.

Dr. A. S. Nissen of St. Peter was elected vice president, and Dr. C. S. Strathern of St. Peter, secretary-treasurer. Dr. Nissen was named delegate to the state medical convention, and Dr. Swan Ericson of Le Sueur, alternate.

Guest speaker at the meeting was Dr. Owen Robbins of Minneapolis.

GEORGE CHASE CHRISTIAN LECTURE

Dr. F. Peyton Rous of the Rockefeller Institute for Medical Research, New York City, will deliver the annual George Chase Christian lecture at the University of Minnesota early in February.

The title of his lecture, which will be concerned with a phase of cancer research, has not yet been announced.

SIOUX VALLEY MEDICAL ASSOCIATION

Dr. E. A. Kilbride of Worthington, Minnesota, is the newly elected president of the Sioux Valley Medical Association, composed of physicians from South Dakota, Iowa, Minnesota and Nebraska.

He was elected at the closing session of a two-day convention held in Sioux Falls, South Dakota, December 4 and 5. Sioux City was chosen as the 1941 meeting place.

Other officers named were Dr. R. S. Westaby of Madison, South Dakota, vice president; Dr. Roy E. Crowder of Sioux City, secretary; and Dr. F. P. Winkler of Sibley, Iowa, treasurer.

AMERICAN COLLEGE OF SURGEONS SECTIONAL MEETING

A sectional meeting of the American College of Surgeons will be held in Minneapolis, March 10, 11 and 12.

More than a thousand surgeons from eight states and one Canadian province are expected to attend. Participating will be surgeons from Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Wisconsin, Kansas, Montana and Manitoba.

In addition to Fellows of the College, members of the medical profession at large, and persons interested in the institutional care of the sick and injured, are invited to attend. The general public is invited to a meeting on Health Conservation to be held the evening of March 12, in Northrop Memorial Auditorium on the University campus.

The program will include the presentation of all types of surgery in hospitals and clinics, papers and panel discussion. More than a score of national figures in surgery will appear as guest speakers. In addition, an elaborate scientific exhibit will feature the meeting.

Dr. William A. Hanson has been named chairman of the Minneapolis committees on arrangements. Dr. William E. Patterson and Dr. Myron O. Henry will serve as vice chairmen, and Dr. James M. Hayes, as secretary.

Chairmen of sub-committees are Dr. L. Haynes Fowler, clinics; Dr. Frederick A. Olson, exhibits; Dr. Thomas J. Kinsella, meeting on health conservation; Dr. James A. Johnson, program; Dr. Martin Nordland, public relations and speakers' assignments; Dr. Theodore H. Sweetser, reception and entertainment; Dr. Arthur F. Bratrud, motion pictures; and Dr. Henry E. Hoffert, transportation and hotels.

Mrs. James A. Johnson is chairman of the committee on ladies' entertainment. She is being assisted by Mrs. Russell W. Morse, vice chairman.

SIGMA XI LECTURES

The University of Minnesota chapter of Sigma Xi, national honor society in science, is again sponsoring a series of science lectures for the general public.

The lectures will be presented in Northrop Memorial Auditorium at 8:15 p. m. on four Fridays in January and February. There is no admission charge.

Opening the series will be Dr. Lloyd H. Reyerson, who will lecture on "Chemistry and Our National Defense," January 31. Dr. Reyerson is professor and administrative assistant in chemistry.

On February 7, Dr. Maurice B. Visscher, head of the division of general physiology in the Medical School, will speak on "Your Heart and You."

"The Common Cold" will be the title of the lecture to be given by Dr. Harold S. Diehl, dean of medical sciences, February 14.

The concluding lecture of the series will be given February 21 by Dr. William A. O'Brien, director of post-graduate medical education. His subject will be "Meeting Middle Age."

CORRESPONDENCE

MANTOUX TESTS IN ALBERT LEA HIGH SCHOOLS

During 1939, the Freeborn County Medical Society performed the Mantoux test on 985 students in the Junior and Senior High School of the Albert Lea schools. Of this entire group 72 (7.2+ %) were found positive. Within this group were thirty-four pupils from the rural area, who had driven with a school bus driver having an active case of pulmonary tuberculosis. Of these, fifteen (44+ per cent) were found to react positively. This bus driver, formerly a farmer, found that farm work brought on fatigue, so he sought and obtained his rest cure as a school bus driver. There was no one to say him nay. He continued driving and coughing (and here we quote from patrons of the school) "until he became so weak he could not turn the bus around alone. Then he quit."

It seems that such tragedies could be largely prevented, if regulations were made and enforced in all schools, that before any contracts are given, all prospective employees of a school must present a certificate that they are free from active tuberculosis, as revealed by the best known methods at our command—the Mantoux test, x-ray and physical examination.

L. J. Kaasa, M.D.

NOTICE

To whom it may concern:

The undersigned, Daniel H. Bessesen, M.D., formerly vice president of the College of Commerce, Inc., has resigned and relinquished his association with said corporation, as of the date, November 16, 1940, and any further use of my name since that date, in connection with the business or affairs of the College of Commerce, Inc., is unauthorized.

(Signed) Daniel H. Bessesen.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of October 9, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 9, 1940. Dinner was served at seven o'clock and the meeting was called to order at 8 p.m. by the President, Dr. James Johnson.

There were fifty-six members and three guests present.

Minutes of the May meeting were read and approved.

Dr. S. E. Sweitzer read the following Memorial to Dr. Frank R. Wright, and a motion was carried that this be spread on the minutes of the Academy and a copy sent to the family.

FRANKLIN R. WRIGHT

1866-1940

Dr. Franklin Randolph Wright, prominent Minneapolis urologist, died August 1, 1940, at the age of 74 years.

Dr. Wright had been a member of the university faculty for 41 years at the time of his retirement in June, 1936, with the rank of Associate Professor Emeritus of Urology. The American Urological Association and the Twin City Urological Society, of which he had long been an influential member, honored him in May of this year through the establishment of the Franklin R. Wright lectureship at the university.

A pioneer in the urological field, Dr. Wright gave their training in venereal disease control to most of the doctors graduated at Minnesota since the turn of the century.

He was born in Canton, Illinois, the son of a physician, Colonel George W. Wright. Following his graduation from the Shenandoah, Iowa, high school, he entered the dental school of the Minnesota Hospital College in 1887, and was graduated in 1890 after the institution had become the dental department of the university.

After two years of dental practice in Hutchinson, Minnesota, Dr. Wright returned to the university to study medicine and received his M.D. degree in 1894. After his internship in Asbury and St. Barnabas hospitals, Dr .Wright did dermatology and venereal disease work with Dr. Max Vander Horck. He was appointed to the university faculty in 1895. Three times—in 1900, 1902 and 1906—Dr. Wright went abroad to take postgraduate work in Berlin and Vienna. During the World War he had charge of the urological work at Camp Custer.

Dr. Wright was made a Fellow of the American College of Surgeons in the 1913 class—the first class chosen by the group's founders. He also was a member of the American Urological Association, the Twin City Urological Society, the Minnesota Dermatological Society, the Chicago Urological Society, the American Medical Association, the Minnesota Academy of Medicine, the Minnesota State Medical Association and the Hennepin County Medical Society.

He also was a member of the Minneapolis Club, the Masonic order and Nu Sigma Nu medical fraternity, and was on the staffs of University, St. Andrews, St. Barnabas, and Eitel hospitals. He retired from active practice recently.

With the death of Dr. Franklin R. Wright, Minnesota has lost one of its outstanding medical men. He loved to teach and did teach for many years at the University of Minnesota. Any young medical man could ask advice from him and it would be freely given. He had a marvelous memory and enjoyed discussing papers, which he did in an inimitable way. His remarks were pungent and he always said what he really thought and was usually right.

The writer went with him to the meetings of the Minnesota Academy of Medicine in Saint Paul for many years. Driving him over from Minneapolis, we talked of many things from "cabbages to kings." He was an interesting personality and a loyal friend.

He will be missed and has left an honorable record of achievements in medicine in Minnesota. —S. E. S.

The scientific program followed.

IDIOPATHIC ULCERATIVE COLITIS

Arnold Schwyzer, M.D.
Saint Paul, Minnesota

To bring this subject for discussion notwithstanding the very small personal experience to which I must confess from the start, has a twofold cause. First of all, the views as to the proper treatment, medical as well as surgical, still differ considerably; and second, my personally observed cases may have some points of interest.

It is not the intention to go into a general discussion of the disease and its treatment beyond a few remarks. One is impressed by the divergent views regarding the treatment when one studies Bargen's work based on the enormous material of the Mayo Clinic and then goes through a paper on the subject read by McKittrick before the American Surgical Association in 1935. The discussion following that paper is of particular interest to the surgeon. Just what is best to do when surgical relief becomes imperative cannot be stated categorically. We are here confronted by a problem where surgery to bring relief in one direction creates often an almost intolerable condition in other ways.

Bargen of the Mayo Clinic appears to have had more experience with medical treatment than perhaps anybody else. In 1933 he reports on a ten years' experience with 1,348 cases[1] He isolated a diplostreptococcus which he considers specific not for all, but for the great majority of these cases. He studied the lesions microscopically and found thrombotic conditions not only in the mucosa but also in the deeper

walls of the gut. Thus one of the characteristics of the disease becomes readily comprehensible, namely the great thickening of the gut wall and the cicatricial foreshortening of the colon tube with loss of haustration. In order to designate this overwhelmingly large group due to a specific agent among the generally named idiopathic form he calls it "thrombo-ulcerative" or also "diplostreptococcic ulcerative" colitis. The bacteriologic findings were apparently not in harmony with the studies at the Massachusetts General Hospital; but when Bargen reports out of 1,348 patients 898 as symptom-free, plus 82 as greatly improved, one cannot help being impressed. About 10 per cent are reported as having died and about 8 per cent as unimproved. These patients were treated with a specific anti-diplostreptococcic serum followed by vaccine injections every five days for months. If possible this vaccine was to be autogenous.

McKittrick does not discuss other treatment than the surgical after medical had proven to be helpless or inadequate[4] As the few cases I am to report were judged to require prompt surgical relief except one, I am not going to discuss the medical treatment and will now simply report on our surgical management.

Case Reports

Case 1.—Mrs. F. P., thirty-three years old, came to us in February, 1919, with a history of having suffered from pain and diarrhea for five years. The bowels moved five to six times a day, and she had much abdominal pain. There were no amebæ found. By different measures she was more or less improved, but returned very discouraged and miserable in February, 1920, after having had frequent spells of great pain. An appendicostomy was made on February 25, 1920, followed by irrigations of the colon, first twice a week and later once. Her best weight ever had been 130 pounds. At the time of operation it was 107 pounds. Four months later it had gone up to 115. She looked very well and felt better. The catheter in the appendicostomy was then removed. After a while the old symptoms recurred alternating with times of some improvement. We did not see her again until February, 1926. There had been no change. The colon from the splenic flexure down showed no haustra, but was not markedly narrowed. Proctoscopically the mucosa was generally congested. She did not appear to be bad enough for surgical interference nor would she have any. We have not seen her since then. On inquiry in February, 1940, she wrote that her condition of late was very bad though she had been doctoring for all these years. A course of Bargen's treatment or with neoprontosil or possibly a colostomy would be advisable.

This is a case which might well have been greatly benefited by Bargen's serum and vaccine, had we had it in those early days. Lockhart-Mummery had considered appendicostomy "the best treatment" for ulcerative colitis.

Case 2.—Miss I. C., eighteen years old, came to us in 1922 with an intractable hemorrhagic colitis from which she had suffered for several weeks. On March 4, 1922, an appendicostomy was made, which was used for irrigations of the colon. These irrigations were done first twice weekly and later only once. She improved gradually though not steadily as there were intervals of bloody diarrhea during the first months. By January, 1923, the appendicostomy was allowed to close. She felt well and was married that same month. In 1926 she had a baby and for one month after that she noticed some blood in the stools; however, there was no pain. She was then not seen till October, 1929, when a painful hernia had developed at the site of the appendicostomy. The bowels apparently did not bother her much. When constipated she noticed a little blood, but gave it no further attention. The hernia was repaired and the stump of the appendix resected. Six weeks after this operation the last entry on her chart reads: "Pain around the navel (which had brought her back to Saint Paul with the mentioned hernia condition) is gone since the operation. Bowels need a little mineral oil every evening."

On February 22, 1940, we received upon inquiry the report that she had been "perfectly" well for sixteen years after that operation until two years ago. Her bowels had moved usually once a day and were entirely normal. She used to take some petrolagar. However, two years ago blood and pus appeared again. Her doctor declared it again ulcerative colitis after proctoscopic examination. For a whole year she was in bed and suffered very much. For three months she received daily acriflavin injections, then enemas with oil, etc., etc. At the end of that year she was taken to Rochester where Dr. Bargen treated her with serum and vaccine and neoprontosil. Within three weeks she felt well enough to go home and though she was advised to return later on, never went back as she felt completely well ever since. She thinks that cod liver oil which Dr. Bargen had ordered did her very much good. Her present weight is 160 pounds though she is only five feet and two inches tall. The bowels move from two to five times a day. Some mucus is present, but she feels and looks well. It is interesting that she was apparently very sensitive toward the serum of which she received about ten very small injections. The case is of particular interest inasmuch as some prominent men have expressed very little faith in such treatment. Another feature of interest is the demonstration that ulcerative colitis may recur after years of clinical "cure." I have little doubt that Bargen's treatment would have cured this patient at the first attack when I had charge of the patient, if the serum had been available at that time.

Case 3.—A girl, R. D., fourteen years old, was brought to us on March 7, 1930, with a history of a colitis from which the child had suffered for ten years. Her mother told us that the child had been strong for the first two years. She then seemed to do reasonably well up to the age of seven or eight years except for continuously loose stools. For the last four years, *i.e.,* from the age of ten to fourteen years, she had not grown any. She had been at the Mayo Clinic several times where at no time was any parasitic infection found. She had lived in Montana all her life. Her mother told us that a year ago multiple ulcers had been noticed in the colon. She had almost continuously blood in her stools for the last four years, and much mucus. The bowels were moving six to eight times daily. The last few years the feces had a very offensive odor. The hemoglobin had been down to 34 per cent in October, 1929, and she then had two transfusions.

Physical findings: Temperature 99.8, pulse 114. The examination of the different organs yielded nothing of interest except a painful, tender, and somewhat distended abdomen. According to the general appearance the apparent age instead of fourteen years was more readily judged to be eight years. The drawn colorless face resembled that of an old woman. She seemed to be in constant misery. The stools contained some blood and considerable pus.

On March 10, 1930, an x-ray study at St. Joseph's Hospital after an opaque enema showed most of the colon well filled. Barium had entered the lower ileum. Haustral markings were absent throughout.

On March 14, we made an ileostomy through a grid-iron incision at McBurney's point. The first intestine presenting was the sigmoid flexure which was very fleshy and rigid; its fatty fringes were hard and rounded. The cecum was found fixed toward the posterior abdominal wall and could not be brought into the wound, because when the intestines were grasped subserous bleeding occurred readily. The lowest ileum loop was also fleshy, thickened and somewhat rigid for about seven centimeters from the cecum. A little beyond this area we made the stoma. Only a cherry-size portion of the gut was allowed to protrude from the circular intestino-cutaneous suture.

The relief after opening the ileostomy was very gratifying. The patient left the hospital on April 9, after having gained five pounds since the operation. She was still very anemic.

At the time of the operation the girl had weighed fifty-one pounds. Three months later her mother writes that the weight was seventy-one pounds and that the patient was gaining every day.

Six months after the ileostomy (September, 1930) she returned to us looking very well, but some eversion of the gut had occurred. Mother and daughter urged us intensively to close the ileostomy because she felt so well and was greatly annoyed by this additional opening. Mother and daughter were quite willing to accept all responsibility for the procedure. It seemed impossible to put them off, and on September 29 we closed the ileostomy which after all was a minor procedure, and if necessary could be undone readily. The gut was only partly freed, and the peritoneal cavity was not opened. The mucosa was simply separated from the skin and then the intestinal wall inverted with two superposed linen purse-string sutures. Two fine linen mattress sutures approximated the fascia. We expressed the possibility and even probability of having to re-open the ileostomy. A year later, September 28, 1931, the notes read that she had grown 2.5 to 3 inches since the closing of the ileostomy, in all about 4 inches since the ileostomy a year and a half before. She had felt "fine" up to July, but with the advent of hot weather, she was "not quite as well." The bowels became "terribly" loose again. A small fecal fistula had persisted; there was, however, only very little fecal discharge. The bowels had then become somewhat better, moving about four times in twenty-four hours. This improvement seemed to be due to paracotoin given by mouth. The fistulous tract became gradually almost insignificant so that it did not seem advisable to do much of an operation. However, minor attempts like hot wire cauterization and resuturing having been unsuccessful, a free opening of the peritoneal cavity would be necessary for a complete closure. So far we have held back. The patient has developed into a stately young woman, has grown much in height, and when last seen in October, 1938, was of good normal weight.



Fig. 1. Case 3. Radiograph taken October, 1938. Barium enema shows loss of haustra, but rather good filling eight years after closing of ileostomy.

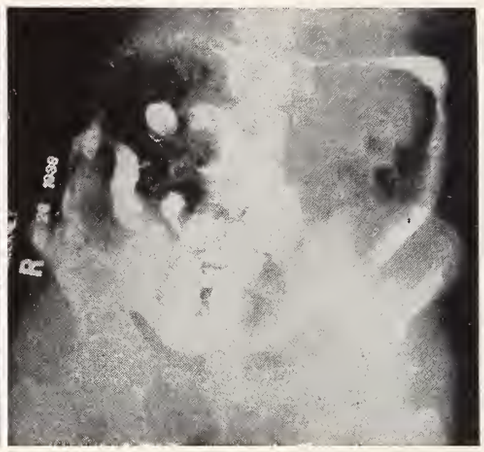


Fig. 2. Case 3. After partial expulsion of barium enema, polyps are seen in descending colon.

Roentgenologic examination was last made in October, 1938. There was evidence of polyposis and the walls of the colon were seen to be very thick. The patient is therefore far from being cured though her general appearance was excellent when we last saw her. It must be taken into consideration that she had been a very severe case and that other measures had been fruitless. For four years she had been treated at intervals at the Mayo Clinic. She had gone through two series of serum treatment followed each time by vaccine injections every five days for six months.

The Rochester Clinic very kindly let us see the roentgenograms made in 1925, 1927, and 1929. Already in July, 1925, the pictures show the lack of haustra and a reflux into the ileum. The colon is quite narrow and shortened. In the 1929 pictures the outline of the barium shadow is fuzzy. A roentgen film made on October 28, 1938, nine years and eight months after the ileostomy shows nothing to be proud of, but the barium shadow gives measurements which appear at least not to have become worse in the eight years since the ileostomy was closed. These measurements are about the same as in 1927 and rather better than in 1929. As mentioned, the shadow of the walls of the colon is seen to be quite thick in the 1938 pictures. They measure mostly about 3/16 of an inch, part of which may, however, be accounted for by the contraction of the emptied gut. After partial emptying of the enema some small polyps are well recognizable in the descending colon (Fig. 2).

Upon our inquiry the young lady writes on February 12, 1940: "My general health is very good. I weigh 113½ pounds, and I am 5 feet ½ inch tall. My hemoglobin is 80 per cent (Sahli). I believe this is better than it has ever been. I do have cramps quite frequently. My bowels move on an average of about seven times in twenty-four hours. I also have a little pain at times. My side drains very little now. I change the dressing about once every two days. It sometimes gets a little irritated, but otherwise does not bother me a lot. My appetite is good and my strength and vitality are very good." It seemed proper to give this report in full as I have not run across case reports where an ileostomy was closed secondarily and was followed by a liveable condition ten years after the ileostomy. The contrast between this favorable report

and the x-ray pictures which demonstrate a far-advanced condition is surprising and noteworthy.*

Case 4.—Mrs. H. C., thirty-five years old, was first admitted to St. Joseph's Hospital under Dr. J. N. Dunn's care on April 1, 1931, for a severe diarrhea which had started acutely a month previously and was getting worse. She had had lighter spells like this several times since 1927. This time the patient had noticed a great deal of mucus and blood from the start of the attack. Of late there were ten to twelve stools every twenty-four hours. Bacteriologic examination of the stools were negative for dysentery, typhoid or paratyphoid bacilli; nor were amebæ found at any time. Much pus and some red cells were seen. The white cell count was 17,200 on April 1, 1931, and 20,100 on April 10. The hemoglobin was 77 per cent. Examination revealed nothing further of interest except a moderate tenderness of the abdomen. Proctoscopic examination (Dr. Dunn) showed the rectal mucosa far up intensely reddened, covered with a purulent discharge and blood. She was treated with different medicaments and irrigations. On April 25 she was allowed to go home, being improved. In October, 1931, she reëntered the hospital and was kindly given into our service. X-ray examination showed the large gut from the left side portion of the transverse colon downward to be narrowed to a ribbon-like tube. The cecum, ascending colon, and proximal part of the transverse colon appeared normal.

Since March she had lost 40 pounds and had had diarrhea alternating with constipation, at which latter periods she suffered from severe bearing-down pains. A stricture of the rectum had been stretched several times.

On October 19, 1931, an ileostomy was then done through a muscle splitting incision at McBurney's point. On November 1 our patient was discharged. She returned for control November 28 feeling "grand" as she expressed it. On October 27, her weight had been 78 pounds. She gradually gained very much in weight and looked not only well but was actually quite plump, apparently heavier than she ever had been. She had gone through so much torture before the ileostomy that she put up with the ileostomy for a long time, but after two years and four months she wanted the artificial anus closed.



Fig. 3. Case 4. Radiograph taken April 8, 1932, six months after ileostomy. The general condition was very much improved.



Fig. 4. Case 4. Radiograph taken October 25, 1933. Notwithstanding the splendid general improvement, the shrinking has progressed when compared with Figure 3, taken a year and a half previously. Note the great thickening of the walls of the colon.



Fig. 5. Case 4. Sketch of ileoproctostomy. Ileum drawn into vagina and one-half of Murphy button (*B*) inserted. The other half is in the infraperitoneal part of the rectum.

This case represented a very vicious and rapidly progressing destructive process. On October 14, 1931, the transverse colon had filled to a diameter of over 1.5 inches and showed deep haustra. By October, 1933, the proximal half of the transverse colon had also shrunk down to a 3/8-inch diameter while the whole left side colon showed as a narrow ribbon (Fig. 4). What was there to do? The right sided colon was of good dimension, but from the hepatic flexure on there was only a thin ribbon left down to the last portion of the ampulla which was about the size of a large plum. I am sure if I had freed the hepatic flexure from its lateral peritoneal attachment and had brought it out obliquely through the right rectus muscle which latter would have acted as a sphincter, her stoma would have been very much less bothersome. H. L. Beie of Iowa City has used this "compromise colostomy" with good success, and it would probably have been the best thing to do under the circumstances. However, our young patient was willing to take all chances to have done away with the artificial opening. A woman wants to be clean and attractive. We deliberated much about a way out of this dilemma. When one entered the upper loop of the ileostomy with a thick sound the tip of it could readily be felt behind the uterus per vaginam. This made us try an anastomosis between this gut and the remnant of the ampulla.

On February 27, 1934, an ileo-proctostomy was made. Under spinal anesthesia vagina and rectum were well cleansed. The remnant of the ampulla did not reach higher than about the upper rim of the internal sphincter. A merthiolate-soaked sponge was inserted into this pocket. Then the posterior cul-de-sac was opened and the ileum loop in which the large bougie was felt was brought into the vagina and a linen purse-string placed in it. The one-half of a small Murphy button was then introduced and the suture tied around it. Then with a finger in the rectum, the musculature of the internal sphincter was laid bare in the vaginal incision and the other half of the button which had a wider rim than its partner was inserted through the anus, the mucosa nicked over it, and the two halves of the button closed. This looked like a very neat union. On account of the thinness of the gut wall, we did not dare to place additional sutures. A collapsible rubber drain was placed to one side of the ileum into the Douglas space. The opening in the vaginal wall was not sutured but simply packed lightly with metaphen

*After writing this paper I received word that the patient died suddenly of what seems to have been an embolus. Her mother writes she had been feeling exceptionally well this past summer.

moistened gauze to assure sufficient drainage and fixation of the loop. A free discission of the anus was made posteriorly to relieve all tension. The ileostomy opening was, of course, left open.

The postoperative course at first was reasonably good though the patient was quite weak. But after two weeks the button had worked loose from the rectum and fecal discharge came through the vagina. The button with the ileum gradually receded toward the sacrum upward, and a month after the operation (March 27) the button had to be removed through the vagina. A thrombosis developed in the left iliac vein and the patient died on April 6.

It was surprising that the rectal wall with the comparatively heavy muscular wall gave way though it contained the wider half of the button. It again demonstrates the importance of the peritoneal covering of the gut with its ready agglutination and fixation to other peritoneal surfaces. The rectal wall had no peritoneum to act promptly for the accomplishment of a union before the button became loose. An additional factor was probably a degree of colitic infection of the rectal wall. We had anticipated this possibility but relied on the large size of the lower half of the button and the fixation of the ileum loop by the packing. There was no peritonitis beyond the localized area of the drained parts in the bottom of the pelvis. A periproctitis as a result of the giving way of the button was undoubtedly the reason for the thrombosis of the iliac vein. In a similar case it would be advisable to fasten the button by a silk thread to a cross bar outside the anus or some similar fixation. The procedure gave the impression that it was a good way out of the necessity of a permanent artificial anus after ileostomy. Perhaps drawing the ileum into the rectum or an additional suture of the ileum loop to the edge of the transverse vaginal incision might have led to success. In case the gut is as thin-walled as in the described case it might be well to use the adjoining mesentery. A lesson to be had from this case is that the extra-peritoneal rectal wall cannot be trusted to hold much in similar cases.

Case 5.—On February 12, 1937, Mrs. A. L. came to see us. She had been married thirteen years, but had never been pregnant. She had been in a sanatorium for a nervous breakdown, and had suffered from colitis with much discharge of mucus for twelve to fifteen years. However, there had been no diarrhea until the last few days. In 1930 a caruncle of the urethra was excised and in 1933 an appendectomy and cholecystectomy had been made and a cyst of an ovary removed. Of late she had been very nervous, sleepless, and irritable. She was well built. Heart, lungs, abdomen, and urine appeared normal. By pelvic examination a rather large cyst was felt on the left ovary. There was some tremor noticed, but the basal metabolic rate was normal. There had been no marked loss of weight. The knee jerks were exaggerated. The cyst with the remainder of the ovary was then removed. It was of the size of a large orange. In addition smaller cysts of the right ovary were punctured and numerous pelvic adhesions divided.

This history is mentioned to give a picture and partial explanation of the neurotic state of the patient. She came back in January, 1938, with most emphatic complaints about her "colitis" and distress in the rectum. On examination we found a stricture of the rectum and a fissure of the anus posteriorly. A barium enema demonstrated a "marked shrinking of the lowest five inches of the rectum." Proctoscopy demonstrated a general bloody oozing from the rectal mucosa which was ulcerated. In her loud almost violent appeal for an absolutely necessary prompt help from her "insufferable" spasms she gave the impression of a desperate neurotic person ready to do most anything. An ileostomy was done on January 14, 1938, in the same manner as described in the previous case with a view to an easy closing when her wrath should turn toward this new situation. A transfusion was also given. Seven weeks later (March 3) she returned to Saint Paul for control. She was much better in every way, but complained of pain and cramps in the ileostomy area, for which injections of quinine and urea gave considerable relief. In October of the same year she returned, mainly for distress in the rectum. There were discharges of mucus and pus often with blood. Some pain was located at the midportion of the descending colon. However, a year later, March, 1939, fourteen months after the operation, she had gained from 120 to 160 pounds.

In September, 1939, she returned and asked to have the ileostomy closed. For nineteen months she had put up with the ileostomy, and she consented to take all responsibility if things should not turn out satisfactorily. It can readily be seen that this caused a favorable mental attitude toward probable future discomfort of minor degree, and we consented. The ileostomy was closed on September 26, 1939, after an injection of 300 c.c. of barley gruel into the efferent ileum loop had caused no trouble and the feces following had shown no blood. While in this case the ulcerative process was located at first mainly in the rectum, an x-ray study made by Dr. Medelman on March 22, 1939, had shown that the ulcerative lesion had extended upward since the previous examination, January 10, 1939. At that time it had involved only the rectum and lower sigmoid while now it extended to the lower part of the descending colon. Whether this extension had occurred in the early months after the ileostomy and had then been arrested remains uncertain. The steady though only very gradual improvement would make one think so.

The hospital chart records on the sixth day after the closure of the ileostomy seven defecations in twenty-four hours with intervals of from two to six hours. Nevertheless, she was allowed to go home two days later.

On February 17, 1940, she writes that she suffers much from gas and during the past months had three severe spells of pain which required morphin, but she winds up her report "on the whole, I think, I am getting along better than you ever expected I would, and I know that if I can get under conditions where I can give myself the care I should have as to work, rest, contentment, etc., I'll be all right as far as one can expect under the circumstances." She reports to have had of late from one to three bowel movements a day. Her weight is given as 165 pounds and her appetite as "unexcelled." What the future has in store for this patient is hard to predict inasmuch as recrudescences belong to the regular picture of ulcerative colitis. The fact that this patient fought energetically for the closing of the ileostomy surely is of marked psychological benefit, as it induces her to make as little as possible of bearable discomfort. On June 20, 1940, she came to our office. She looked very well and was apparently comfortable most of the time and pretty well satisfied with her condition. We advised a course of Bargen's serum and vaccine and neoprontosil[2] to be given by her home physician. Of recent days neoprontosil on account of its low toxicity, much less than some other sulfanilamide derivatives, has been used extensively by Bargen and has become a valuable drug for ulcerative colitis. Her local physician writes on September 23, 1940, that she quit using the vaccine after two months claiming she had no benefit and that sporadic outbursts of aggravation can invariably be traced to some psychic factor. She gained weight recently. Had it not been for the proctoscopic picture with the ready bleeding and ulcerated condition, one would think that the trouble was simply neurogenic. Her father had suffered from senile insanity.

Recapitulating these five cases:

All were women. The first one had a moderate chronic form where after much medical management an appendicostomy was done with a distinct temporary relief while the catheter was in place, but after removal of the catheter the condition became again more aggravated and remained about the same as before. The trouble has existed now for twenty-six years.

The second patient had an acute condition where an appendicostomy was followed by what seemed to be a complete cure for sixteen years. Then a relapse occurred of very serious character. It was promptly checked by Bargen's treatment plus neoprontosil. She has been well since then (twenty months).

The third, a very severe case, had an ileostomy with great benefit. The ileostomy opening was closed six and a half months later. She remained in good general health and was reasonably comfortable for ten years. The colon shows, however, serious changes.

The fourth patient had improved splendidly after ileostomy, but died after an unsuccessful attempt to anastomose the ileum with the remnant of the ampulla recti.

The fifth patient had an ileostomy which was closed nineteen months later (September, 1939) and up to the present (twelve months) since the closure of the ileostomy has remained satisfied.

These reported cases were clinically idiopathic ulcerative colitis. One has to exclude amebic dysentery which gives proctoscopically the picture of a rather normal not noticeably congested mucosa with here and there very small superficial ulcers. In bacillary dysentery, even in the cases later classified as chronic, the onset is most always acute, very often as part of an epidemic. The severe diarrhea is the outstanding feature. Tuberculous ulcers of the rectum occur late in a greatly emaciated patient, toward the end stage of a tuberculous process farther up, mostly in the cecum. The idiopathic ulcerative colitis, on the other hand, starts low in the large gut and progresses upward in the colon. The rectal mucosa is greatly and diffusely congested and bleeds readily. Ulcers are not easily recognized and are quite small. Bargen points out that at an early stage hyperemia and edema are seen followed soon by miliary little abscesses turning into small ulcers, which later become confluent.

Surgical Treatment

The least interfering procedure but also the least effective is an appendicostomy, followed by plain water irrigations. In general Bargen is surely right when he deprecates much flushing of the colon, as rest for the gut is important. Nevertheless, this procedure may have a beneficial influence in an occasional recent case as our second case showed. Whether the appendicostomy had much to do with the favorable outcome may be considered doubtful. Many factors come into play, not the least of which are psychic. McKittrick reports on 149 cases admitted to the Massachusetts General Hospital during the twenty preceding years. There were four appendicostomies, with two deaths. Apparently the appendicostomies were mainly performed in the earlier years of this period. Our two cases were our earliest ones. We were uncertain what to do and feared to do something that could not be undone. H. L. Beie discussed McKittrick's paper and reported on thirty-nine patients operated upon at the Iowa University Hospital. He had had very discouraging results with ileostomy (twelve cases) and therefore went back to appendicostomy and cecostomy as a compromise operation. He often saw a striking degree of improvement in the twenty-one patients operated upon in this manner. Among these twenty-one cases there were five deaths, two of which occurred in the hospital and three died subsequently from the disease. There was one cure which clinically after three years could be classed as complete. The bowel in this case is, however, not cured, as demonstrated by the roentgen findings. The bowels move only once a day. Another patient gained 20 pounds, has the catheter still in place and does heavy farm work. His bowels move twice a day. Eight other patients showed slight to considerable improvement. One patient had no benefit at all, and Beie thinks he was made worse. Of the twenty-one cases five had subsequent colectomies or colostomies. He declares to have learned that if this method is employed the tube must be worn permanently, except in a very lucky case. I have quoted Beie more or less in detail because his views appeal to me very much. Of special interest is that he performed colostomy in eleven cases as a "compromise operation" between appendicostomy and ileostomy in cases where only the left side colon was affected. In four cases he made a colostomy on the midportion of the transverse colon notwithstanding the fact that this part of the bowel was moderately diseased though less than the lower regions. When this can be done, it is of very great advantage inasmuch as the patient is immeasurably more comfortable than with an ileostomy.

Ileostomy may be the best immediate way out of serious trouble, but it leaves mostly a very unsatisfactory situation. At the Mayo Clinic it has been less and less employed for this reason. McKittrick reports fifty-four ileostomies among his 140 cases, with fifteen deaths. He very appropriately declares that in order to be satisfied with an ileostomy, a patient must have experienced what misery ulcerative colitis brings on. All three of our ileostomy patients admitted that they were relieved of unbearable misery but later on would not put up with the state of affairs and implored us to close the opening. They were all women, or rather two women and a young girl. A man is perhaps a little less sensitive, but a woman cannot be happy unless she is clean and attractive. The result of closing the ileostomy in two of the reported cases is therefore of interest even if they should only represent exceptional conditions. One had the ileostomy closed and was satisfied and reasonably comfortable for ten years afterward. The other who had her ileostomy closed a year ago is rather satisfied so far.

All surgeons appear to admit that ileostomy with exceedingly few exceptions leaves a lamentable state of affairs. It is best done in the most simple manner through a grid-iron incision. R. H. Miller in the above mentioned discussion of McKittrick's paper lays

stress on this point, and he warns against exploration. Much handling of the gut is to be avoided as it may set up a general peritonitis. He compares the condition of the gut wall with that of a canvas tent in a rain storm. It remains dry inside until you draw a finger along it, when it starts to drip. In one of our cases we mentioned that getting hold of the gut caused hemorrhagic suffusion. The intestine, therefore, has to be handled with utmost care.

In looking for an improvement of the condition following ileostomy it appeared to me one could lead the gut on a slant through the rectus muscle. This would create some sort of a sphincter. In addition there would be less of a tendency toward an eversion of the gut which happens not infrequently. A catheter might be used for evacuation.

If the ileostomy is done in such a manner that it can be closed later on rather easily, the decision to have such an artificial opening established at least temporarily is made easier for the patient.

Colectomy remains as the final trump card which the surgeon holds. While it is not as formidable an operation as it might appear, the preservation of the normal rectal sphincter would be of great value where the case allows it, and under such circumstances a trial like in Case 4 with or without a colectomy later on seems permissible.

The course of the disease with its remissions over long periods of time, and the very harmful influence of mental upsets make one hesitate in accepting the condition as a straight infectious process. Fear, wrath, and similar excitement act strongly on the autonomic nervous system. Adrenin is poured out, not only by stimulation of the adrenals, but the ends of the sympathetic fibres create locally adrenin on stimulation. Daily observation tells us that in an infected tissue the nerves are abnormally sensitive to stimulation. Inasmuch as even in a normal individual severe peristaltic contraction of the colon may be observed in sudden fear, the spasms of an infected gut in an individual with a very labile mental equilibrium would naturally be much increased. And now another factor enters: in thrombo-ulcerative colitis the infection reaches deeply into the gut wall. While rest is the paramount requisite for inflamed tissues to heal by not interfering with Nature's repair work, we can readily recognize the deleterious effect of spasms. The statement of our last mentioned patient that acute aggravations could invariably be traced to mental upsets is significant. And still another factor is to be considered. Physiologists have shown that adrenin is only one of the substances produced by nerve stimulation. Deeper changes in the chemism of the parenchymatous organs through nerve influence may have to be reckoned with. This would be in harmony with the good results by parenteral liver therapy as reported recently by G. Cheney.[3]

Even this, our very small experience, demonstrates the great variation in individual patients. Though they were all surgical cases, the hope for the future must lie in the medical treatment, which with serum and vaccine and especially neoprontosil has produced noteworthy results and for this reason ought to be tried before resorting to surgery in all but the most violent acute upsets.

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Discussion

Albert M. Snell, Rochester: It is always a pleasure to hear Dr. Schwyzer recount his experiences and his remarks tonight are of particular interest to those who have had any experience in the treatment of ulcerative colitis.

There are one or two recent points in treatment which can be mentioned. The first has to do with the nutritional aspects of the disease. It has been noted for a long time that deficiency states of one type or another are not uncommon complications in advanced ulcerative colitis. It is believed generally that these are due to faulty absorption of vitamins from the intestinal tract. In some cases it is apparent that the defect in absorption may be considerable, since patients may present themselves with pellagra, peripheral neuritis or marked deficiency in prothrombin. Mackie reported that 63 per cent of the patients with ulcerative colitis who were under his care at the Roosevelt Hospital had nutritional disturbances of some type. It is now considered good practice to use generous supplies of the vitamin B complex and other vitamins in treatment of the disease; some rather encouraging results have been noted.

The use of derivatives of sulfanilamide in treatment of the condition is still being investigated. As is generally known, fatty metamorphosis of the liver may develop in cases of ulcerative colitis; hence, such patients may be vulnerable to the hepatotoxic effect of some of these drugs. I have seen one or two instances of subacute atrophy of the liver following their use. A new compound, sulfaguanidine, appears to be of some promise for it is less toxic and absorbed more slowly than some of the compounds of sulfanilamide now in general use. However, our experience with sulfaguanidine has been limited.

Dr. Alfred Hoff, Saint Paul: I was very much interested in this paper and in Dr. Snell's discussion. I have followed one case for twenty-one years, which I think is worthy of presentation at this time. My first contact with the patient was in 1919 when she was suffering with an acute fulminant ulcerative colitis. She remained in the hospital four months; her temperature ranging from 102° to 104°, with frequent stools containing mucus, blood and pus. She became marasmic, losing about 50 pounds in weight, and was confined to bed for a total of six months. She gradually recovered her weight loss and, except for some abdominal discomfort, remained well for a period of ten years, when she relapsed and again went through the same severe infection with a course almost identical with that of the first attack. It had the same long duration and severe symptoms.

I saw her last week—twenty-one years later. She now weighs 133 pounds and says that, except for occasional abdominal cramps with slight diarrhea, she is in good condition. A proctoscopic examination in 1934 showed no ulcerations and the rectal folds were not indurated. A barium enema at that time revealed an absence of haustrations involving the colon generally with constriction of the lumen of the bowel in the pelvic colon.

Another case of interest is an autopsy proven case

of chronic ulcerative colitis in a man sixty-nine years of age. It was associated with a severe depression of the bone marrow, showing a marked anemia and a progressively more profound leucopenia involving especially the granulocytic series. No immaturity of cells was noted and a postmortem bone marrow study at Dr. Downey's laboratory revealed a severe leucopenia in the marrow with invasion of lymphocytes while the neutrophils in toto amounted to only 8.5 per cent of the total number of cells. The bone marrow, therefore, was regarded as not completely agranulocytic. During a period of six weeks' observation with repeated blood studies, his hemoglobin averaged 52 per cent, the high 68 per cent and the low 37 per cent shortly before death. The average of seven erythrocyte counts was 3,000,000. The leukocytes on admission to the hospital numbered 1,600 with 38 per cent neutrophils, 49 per cent lymphocytes, 10 per cent monocytes, 2 per cent eosinophils and 1 per cent basophils. During the following six weeks, they progressively fell lower until the day before his death his leukocytes numbered 130 cells with 36 per cent neutrophils and 64 per cent lymphocytes. No immaturity was found. Terminally, he developed a severe membranous sore throat with chills and high fever, so often seen in blood dyscrasias.

In view of his blood findings, one is hardly justified in considering this to be a case of true agranulocytosis. No history of any medication was present. An effort was made to stimulate his bone marrow function with the use of liver extract and pentnucleotide.

Of interest also is the fact that this patient was a bachelor living alone on a small farm, where, for a considerable period of time, his diet had been very inadequate.

Dr. James Johnson, Minneapolis: There are two questions I would like to ask Dr. Schwyzer, who has had vast experience along this line:

1. Does he not feel that once an ulcerative colitis, always an ulcerative colitis?
2. Does he believe there is any one thing that causes ulcerative colitis; or, at least when we meet these cases, isn't there a great multiplicity of causes responsible for the continuation of the condition?

I have had patients get well on Bargen's vaccine, tomatoes, peanuts and sunshine. For example, I have placed them on restricted diets and they have constantly become worse; and then, in desperation, they would go ahead and eat everything they wanted and get well. There is, no doubt, a variety of causes, perhaps largely on a deficiency basis.

Dr. Arnold Schwyzer (in closing): First, to answer the question of—once a colitis always colitis. That theory was proclaimed vividly by Dr. D. F. Jones at the mentioned meeting of the American Surgical Association. In his opinion, there would always be a colectomy in the end if the patient did not die beforehand.

In the paper I reported the two cases, one well for sixteen years and the other ten years; well surgically, but not anatomically. Some cases improve but you cannot foresee the course. There is always the question whether the improved ones had the same condition as the others. Bargen has given this subject a very great amount of attention, and he had such a large percentage of good effects from serum and vaccine that this fact remains of outstanding importance.

In the one case I mentioned, the woman had been in bed for a whole year with terrible misery and then, after vaccine, serum and neoprontosil, in three weeks feels well and never feels she needs further attention.

The fifth one of my cases well demonstrates the nervous influence. Every time she has an upset, it is due to some psychic irritation.

Under such conditions, the autonomic nervous system is especially much worked up. We know that from the very ends of the activated motor nerves there is a formation of adrenalin. As the nerves of the muscular coat of the gut are irritated by the inflammation, there is going to be more and worse spasms, and spasms are the worst thing for the healing of the infection. To have healing, there ought to be rest; so in these cases we have a vicious circle. We have to figure also with an effect on parenchymatous organs as well by nerve action as purely chemically from toxic products.

As I mentioned in the paper, Cheney reports very good results from parenteral administration of liver extract. The causative micro-organisms may be different in different patients and each case thus remains a problem of its own.

THE TREATMENT OF ACUTE CORONARY OCCLUSION BY LONG CONTINUED USE OF OXYGEN THERAPY

An Experiment

C. N. Hensel, M.D., F.A.C.P.

Saint Paul, Minnesota

For years the only remedies for the treatment of acute coronary thrombosis were bed rest and morphine. Occasionally a case was encountered in which morphine did not relieve pain, or in which the circulation seemed to fail; then oxygen by means of the oxygen tent was supplied, often with beneficial results on both pain and circulatory support.

In December, 1938, Dr. Walter Boothby demonstrated before the Minnesota Society of Internal Medicine his B. L. B. mask for giving 100 per cent oxygen. It was shown that oxygen by this method was much less expensive, easier to apply, better tolerated than the tent, and above all, that it delivered approximately 100 per cent oxygen to the trachea, whereas the oxygen content of the tent, at best, was only 60 per cent.

Boothby further demonstrated that by this method of giving 100 per cent oxygen, the arterial blood would contain 10 to 15 per cent more oxygen. The amount of supersaturation would depend on the level of the hemoglobin and on the rate of the circulation.

He stated that under normal conditions, as the blood passes through the capillaries, the rate of circulation is so regulated that it gives up about one-third of its oxygen to the tissues and enters the veins about 60 per cent saturated, at which degree of saturation the partial pressure of oxygen in the capillaries would be approximately 35 mm. of mercury. When the rate of circulation is decreased, the blood may give up nearly 80 per cent of its oxygen as it passes through the capillaries; therefore the venous blood is only 20 per cent saturated and exerts a partial pressure of oxygen of only 14 mm.

This lowered capillary tension probably reduces capillary tone, favors capillary dilatation, and increases circulatory stasis. In most cases of acute coronary thrombosis, there exists in addition to pain, a marked drop in blood pressure and signs of shock.

Because of the above factors oxygen therapy is indicated in the treatment of acute coronary thrombosis and has been used successfully during the past two years

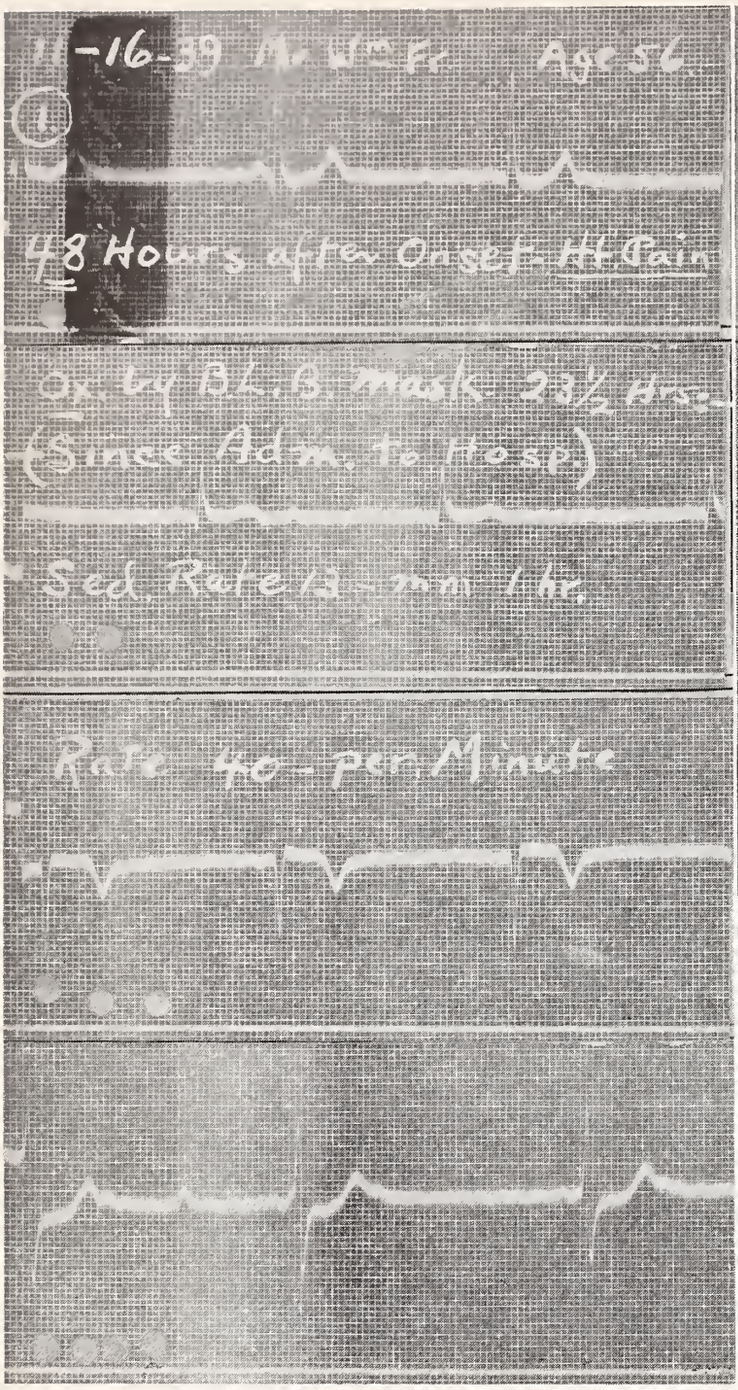


Fig. 1. Electrocardiogram taken forty-eight hours after onset of heart pain shows a rate of forty beats per minute, and a slurring take-off of the T wave in leads 1 and 2, and a flattened T wave in lead 2 and crescentric downward deflection of the T wave in lead 3.

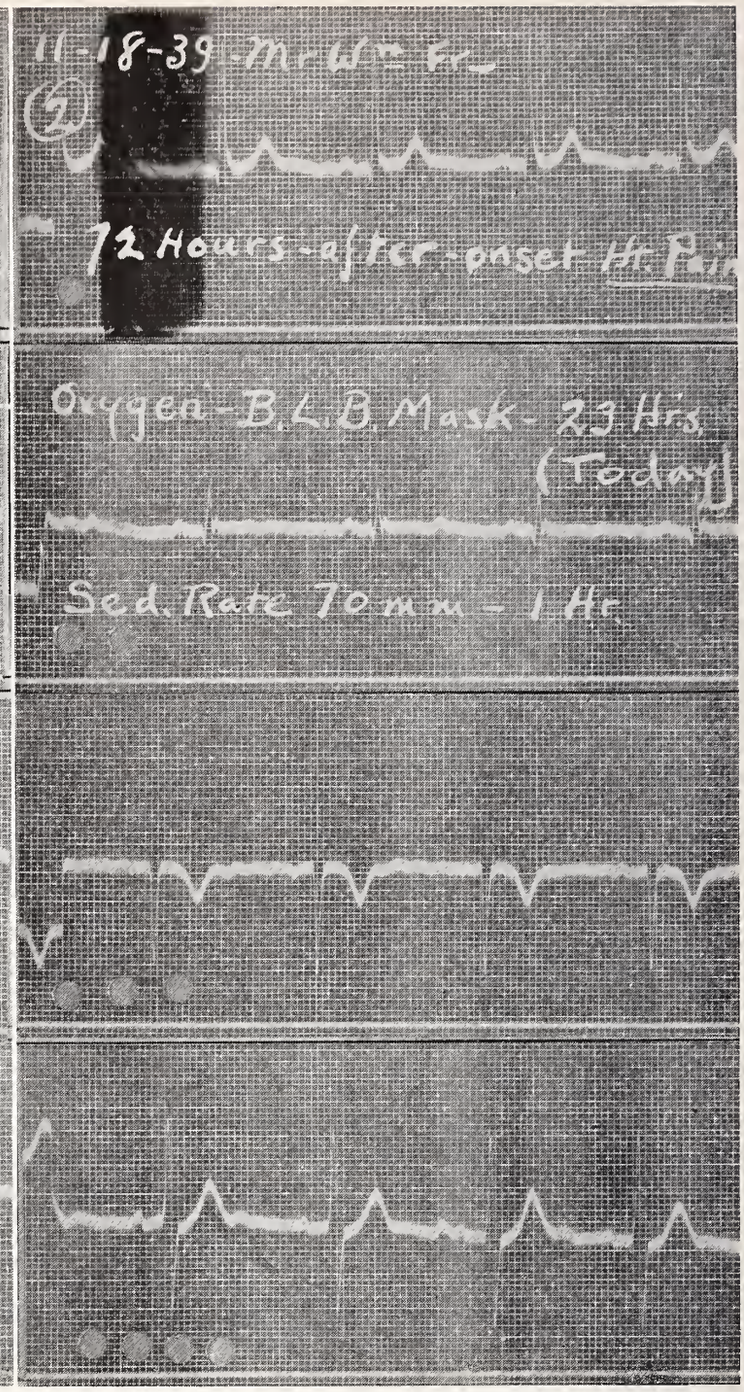


Fig. 2. Electrocardiogram taken seventy-two hours after onset of pain shows a rate of sixty beats per minute and a rising in the take-off of the T wave in leads 1 and 2, and an increase in the slurring in lead 2. T_2 is now iso-electric and the downward descent of T_3 has increased.

by the B. L. B. mask. Its use has usually been discontinued at the end of twelve to twenty-four or forty-eight hours, when the signs of shock had abated and pain had disappeared. However, I encountered a case of acute coronary thrombosis in a man, who, because of pain and marked cyanosis, needed to have the oxygen therapy by the B. L. B. mask pretty continuously for fourteen days, before his cyanosis could be controlled.

From then until the twenty-eighth day oxygen therapy was continued on theoretical grounds in gradually decreasing amounts.

Case History

The patient, Wm. Fr., aged fifty-five, a wholesale meat dealer, was admitted to the Miller Hospital by ambulance at 3 p.m., November 15, 1939, suffering from substernal pain radiating to the shoulders and arms of twenty-four hours' duration.

History of Complaint.—A business executive, under great strain for the previous ten years, and while apparently in good health and strong (often shouldered 200 pounds of beef easily) left an exciting Downtown Quarterback's luncheon meeting and walked five blocks to his parked automobile. During his post-prandial walk he experienced severe substernal pain but after a ten-minute rest was sufficiently relieved so that he made calls on his trade during the afternoon. He returned to his home complaining of a dull ache beneath the sternum and spent a restless night because of this substernal ache.

He worked till noon of the next day, but returned home because of the pain and called the family physi-

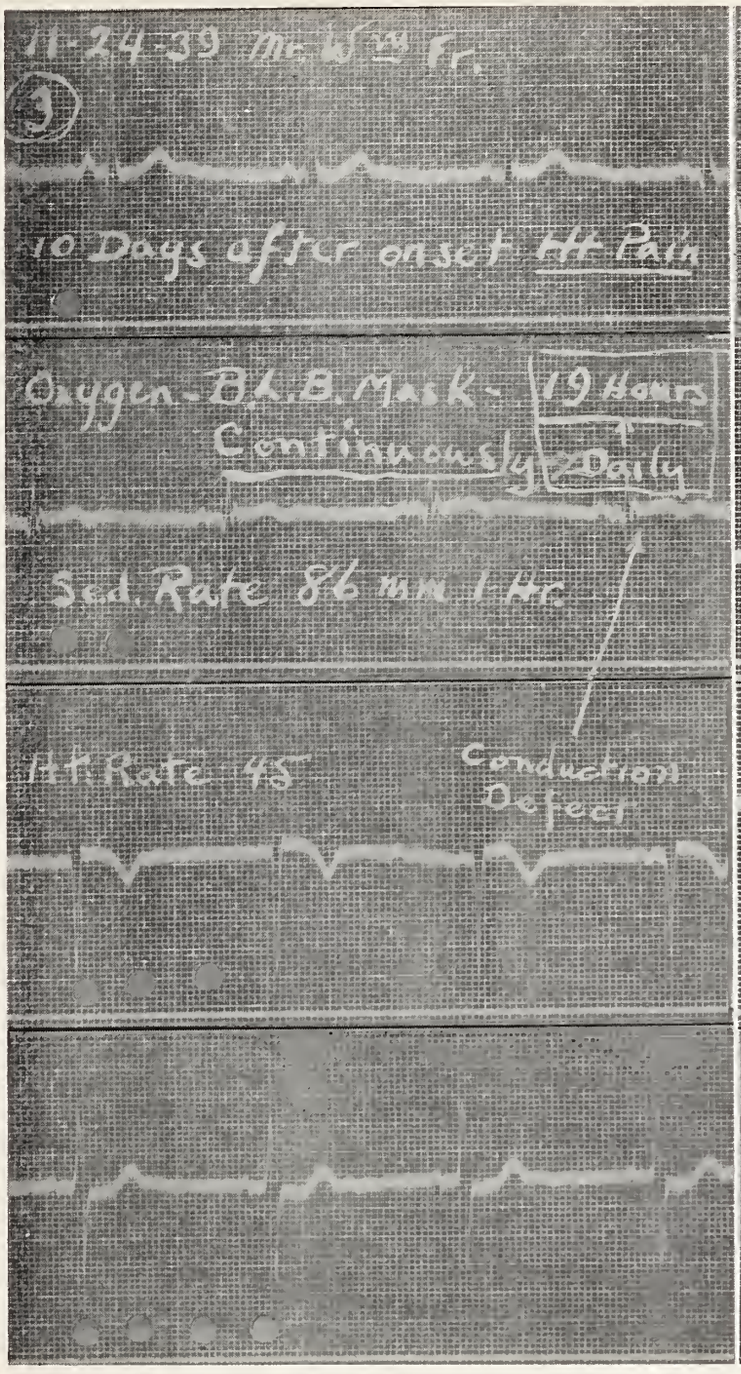


Fig. 3. Electrocardiogram taken ten days after onset of heart pain shows a heart rate of forty-five beats per minute, and an increase in signs of slurring of take-off of T_2, and a beginning downward descent of T_2.

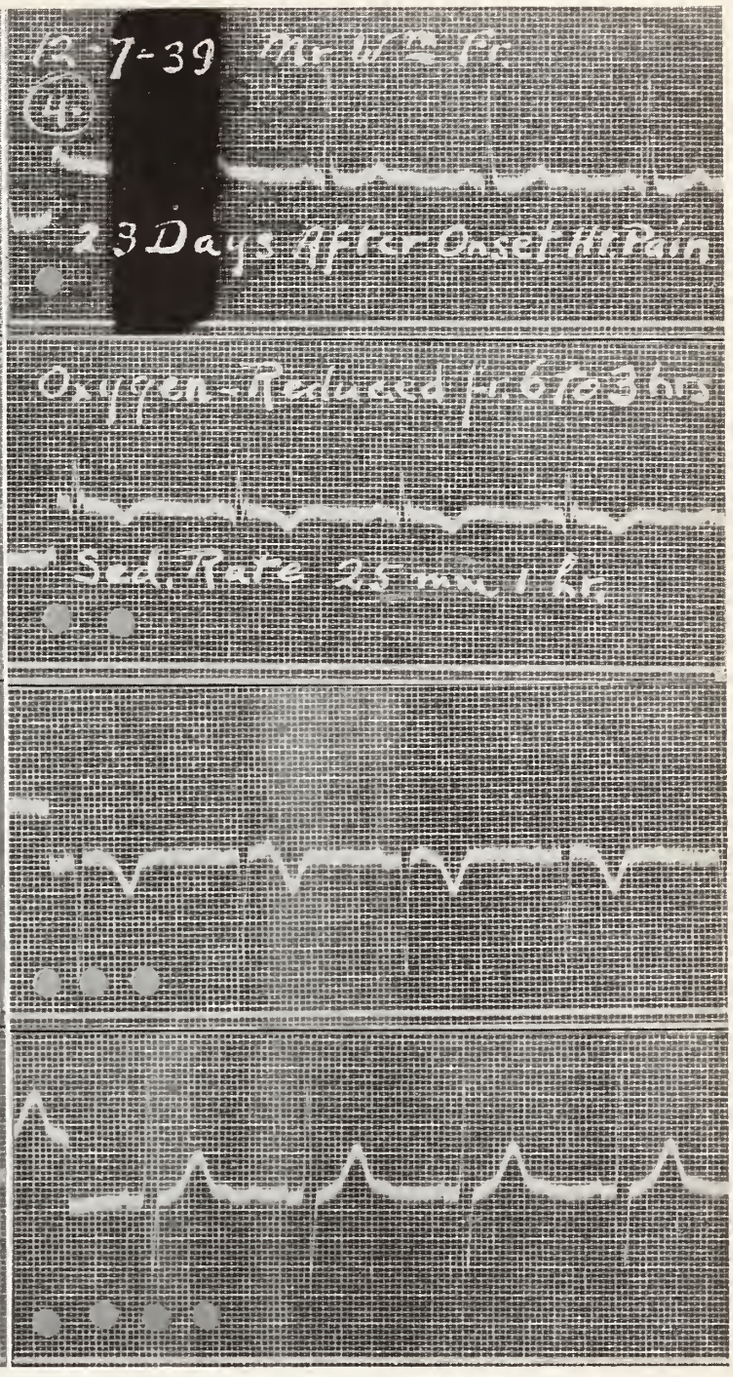


Fig. 4. Electrocardiogram taken twenty-three days after onset of pain shows a heart rate of sixty beats per minute, a flattening in the contour of T_1, and a further inversion in T_2. In lead 2 the T wave shows a crescentric downward deflection. The change in the contour of 2 and 3 is suggestive of an involvement of the branch of the right coronary artery.

cian. He was seen at home by the family physician about 2 p.m. (twenty-six hours after onset of pain) with a heart rate of 90 and a blood pressure reading of 160/90, and was sent to the hospital with a diagnosis of probable coronary occlusion.

When first seen by me the patient was in a state of profound shock. There was an ashy grey pallor in his face, combined with a deep cyanosis of the lips, cheeks, and ears. His heart rate was 30 beats per minute, the rhythm was regular, the tones were faint and distant in character. No murmurs were elicited, and there were no congestive rales in the lungs or passive congestion of the liver. From the patient's facies and general condition, death appeared imminent. Blood pressure 94/54.

Treatment.—Continuous oxygen therapy (100 per cent) by the B. L. B. mask was started, and morphine and glucose were given. Diet was limited to 500 calories a day.

Diagnosis.—Slow coronary occlusion with heart block; condition critical.

Course.—Within one-half hour after giving morphine, gr. ¼, by hypodermic, and applying oxygen, the pain was reduced in severity, and the patient appeared to be resting comfortably. At the end of three hours of 100 per cent oxygen therapy by the B. L. B. mask, the state of marked cyanosis and shock was improved, the pulse rate was recorded at 60 beats per minute, and the blood pressure at 145/85. During the night the pulse rate varied from 60 to 42 beats per minute.

The second day in the hospital and forty-eight hours after onset of substernal pain, the patient's condition was still critical. The heart rate was 44, rhythm regular, tones faint and distant. Blood pressure 115/85. When the mask was removed ten minutes for light breakfast, the substernal pain reappeared, and later when the mask was removed while an E.K.G. was taken the pain again reappeared. The patient was

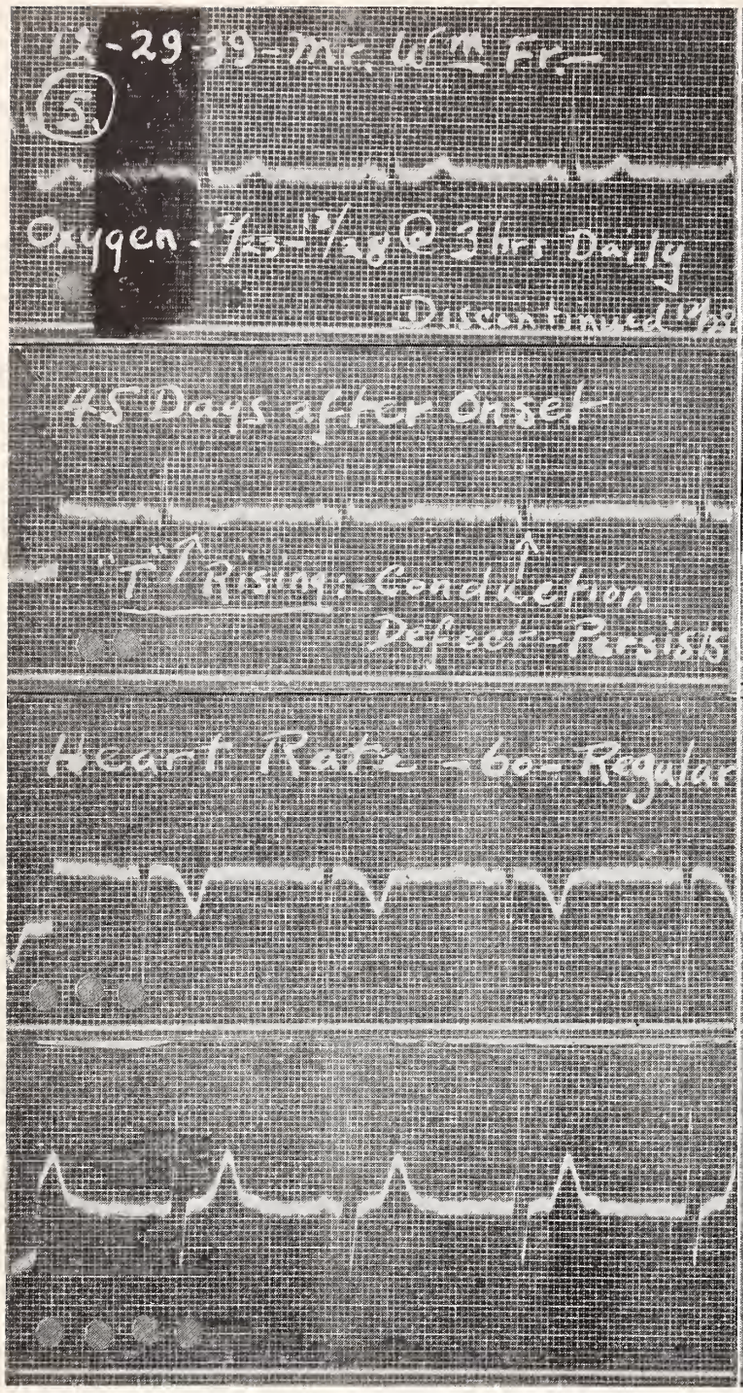


Fig. 5. Electrocardiogram taken six weeks after onset of heart pain shows a heart rate of sixty-two beats per minute, a persistance of the conduction defect in leads 1 and 2, but a rising of the T_2 to a nearly iso-electric position.

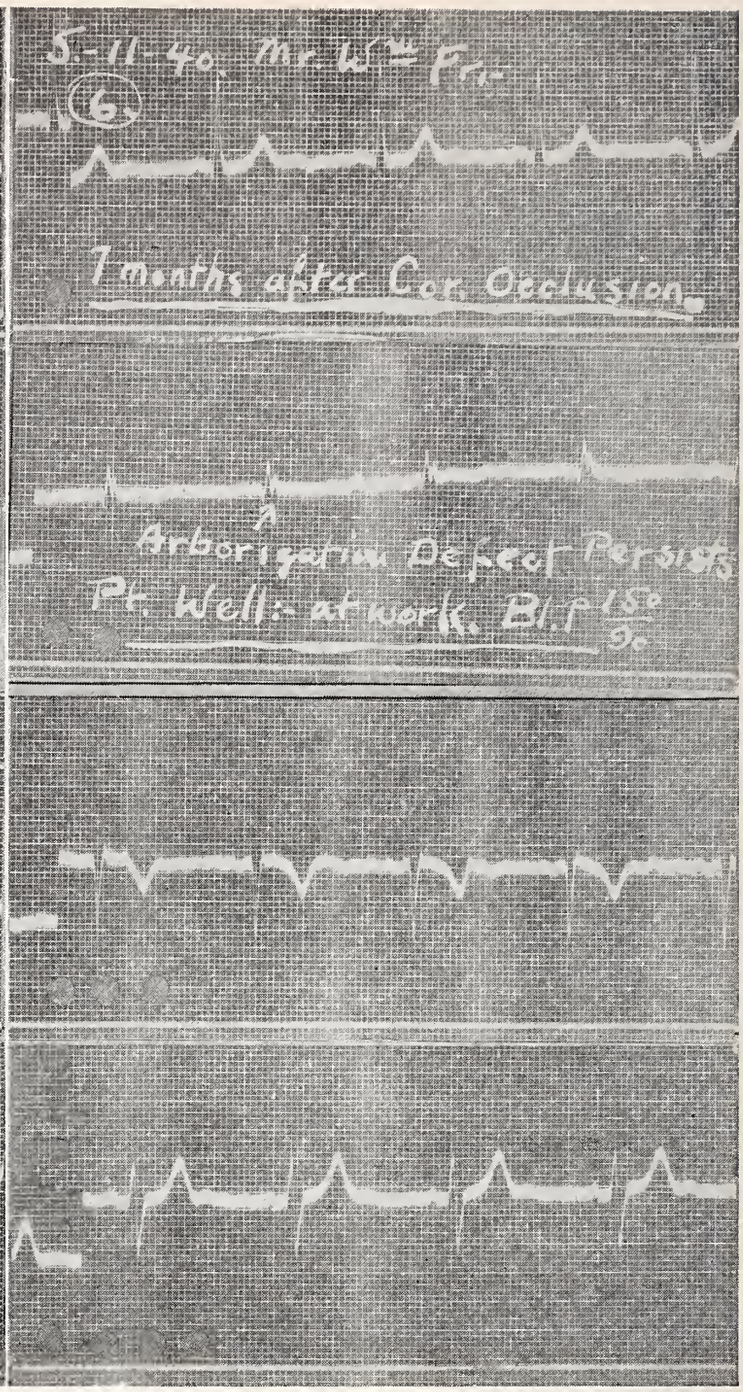


Fig. 6. Electrocardiogram taken seven months after onset of heart pain resulting from coronary occlusion. Shows a heart rate of sixty-two beats per minute and a regular rhythm. PR interval is .16 seconds, QRS .08 seconds, and RT .44 seconds. The T_1 is of normal contour and good height, and the take-off is returned to the normal position with only a minimal amount of slurring in evidence. In lead 2, QRS shows a marked stunting and notching in the descending limb, characteristic of aborization defect. The T_2 is flat in contour and diphasic in outline. The T wave in lead 3 still shows crescentric downward deflection. This record shows that there has been involvement both of the right ventricular wall and the interventricular septum.

without a mask but a half hour of the second twenty-four hours of his illness.

Sedimentation rate was 13 mm. at the end of 1 hour. Hemoglobin 15.6 gm. (93 per cent). Leukocytes 11,800.

On the third day in hospital, the mask was off a total of 1.5 hours and pain and cyanosis returned.

On the fourth day in hospital the patient complained of tightness and pain around the heart. A coarse pericardial friction rub was clearly audible. Sedimentation rate was 70 mm. at the end of 1 hour. Temperature 101° (rectal).

On the fifth day in the hospital the friction rub over the pericardium was absent. The oxygen mask was off 20 minutes four times this day but cyanosis was marked when the mask was off.

On the seventh day in hospital when the oxygen mask was off for thirty minutes, there was no dyspnea, no reduction in pulse volume, and no change in color. The pulse rate was forty-eight beats per minute, respirations twenty per minute. When the oxygen mask was off for forty consecutive minutes, the lips gradually darkened to cyanosis. The oxygen mask was off for a total of ninety-five minutes.

On the eighth day in the hospital, the oxygen mask was off for three periods of forty minutes each, a total of 120 minutes. Slight periodic pain in the cardiac region, slight cyanosis was present when the mask was off.

On the ninth day in the hospital, the oxygen mask was off for five periods varying from fifteen to sixty minutes. No heart pain occurred, and no cyanosis developed. The total time the mask was off was three hours, twenty minutes.

CHART I. GRAPH SHOWING THE HOURS OF OXYGEN ADMINISTRATION DAILY

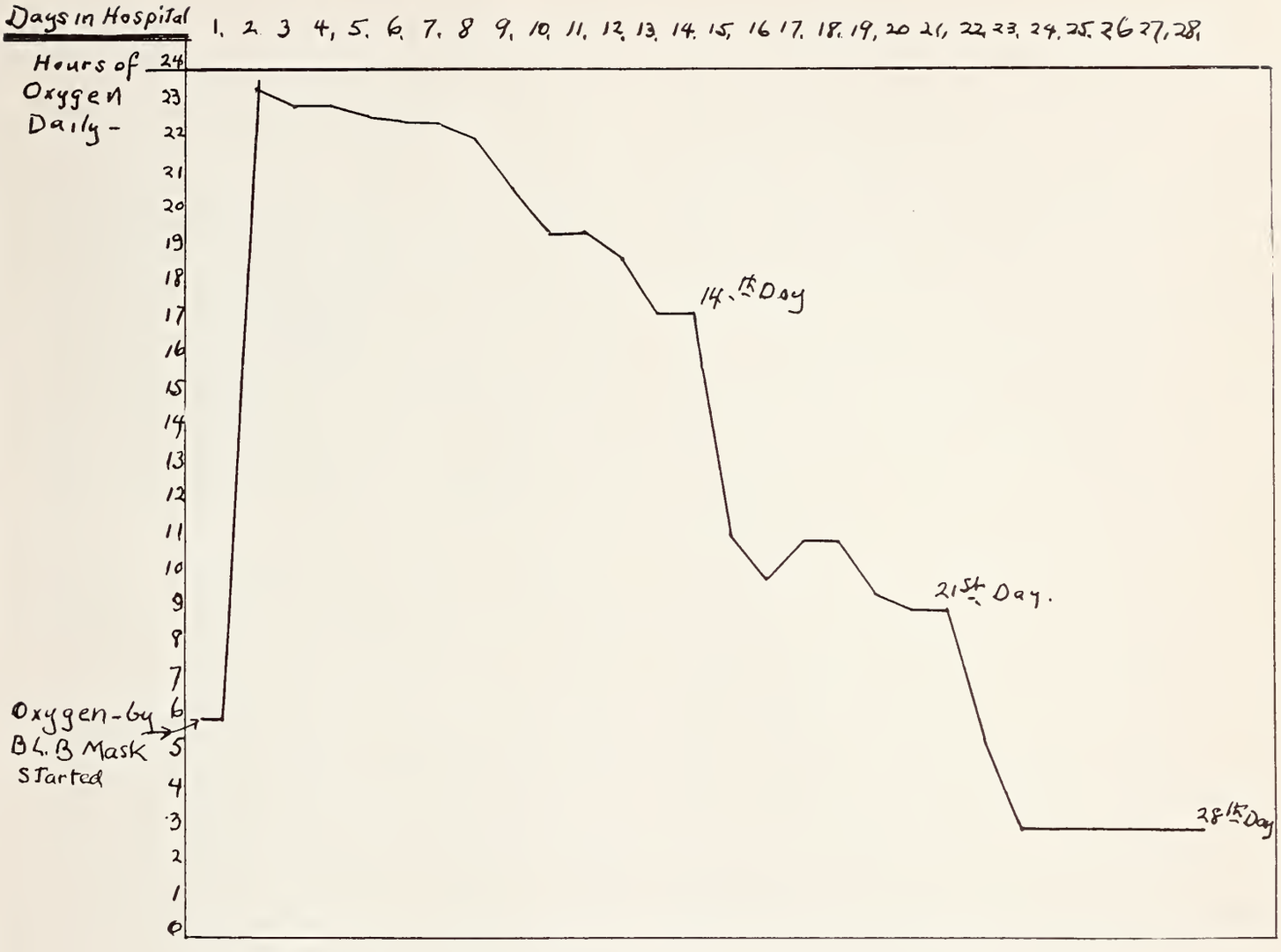
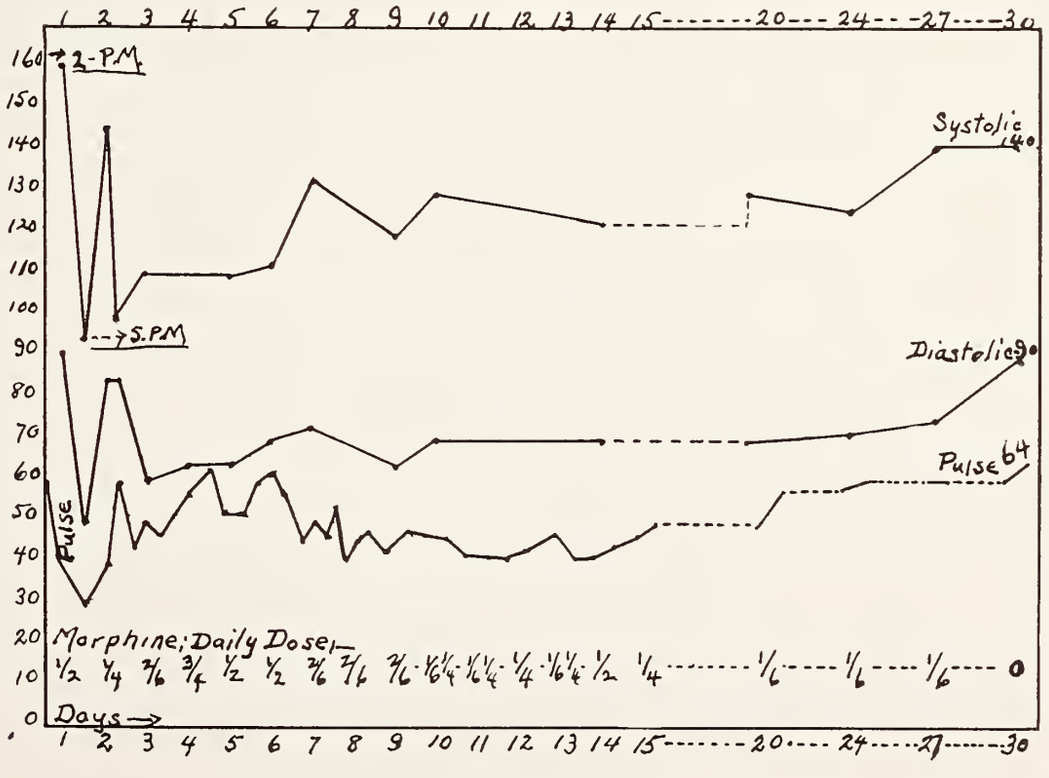


CHART II. COURSE OF BLOOD PRESSURE AND PULSE THROUGHOUT THIRTY DAYS OF SICKNESS



On the tenth day in the hospital, when the oxygen mask was off one and one half hours, the lips became cyanotic towards the end of the time, but no dyspnea developed. There was no change in pulse rate or volume. The total time the mask was off was four and a half hours at intervals of from one half to one and one half hours.

The quantity of food allowed daily was gradually raised to 1200 calories in the past few days.

On the fourteenth day in the hospital, the total time the oxygen mask was off was six hours and fifty minutes at intervals from one half hour up to three hours. Cyanosis was absent all day and in its place there appeared a "ruddy" color to the face similar to that in polycythemia vera. Pulse was fifty-two beats per minute, rhythm regular, and blood pressure 122/70.

TABLE I. SEDIMENTATION RATE

(Note marked early increase and later decrease)

Date	Sedimentation Rate Per Hour	
11-16-39	13 mm	2nd day
11-18-39	70 mm	4th day
11-23-39	86 mm	9th day
12- 2-39	50 mm	17th day
12-13-39	25 mm	28th day

Comment

To one watching this patient as closely as I did, the value of continuous 100 per cent oxygen therapy by the B. L. B. mask seemed without question a probable life-saving measure, during the first few days.

The relative bradycardia with a resultant slowed circulation rate, probably made heavy drafts on the oxygen content of the circulating blood, resulting in marked cyanosis.

I reasoned that if the capillaries in the cheeks show cyanosis, then the capillaries in the heart muscle must also show cyanosis (registering tissue anoxemia), and as long as this condition existed, a supplemental supply of oxygen was necessary and should be given.

I was aware of Dr. Boothby's caution in his article on "Oxygen Therapy" in the July, 1939, issue of *Medical Clinics of North America; i.e.,* "until further experiments have been carried out, it is inadvisable to administer pure oxygen for longer than two days." But in this particular case I had no alternative but to continue oxygen therapy as long as cyanosis persisted.

The only objectionable symptoms which arose during the long period of continuous oxygen therapy were motor restlessness during sleep, a tendency to wakefulness, mental excitability, and talkativeness during the night. These symptoms were promptly reduced and often controlled by moderate doses of morphine hypodermically. While under the oxygen mask through the day, the patient often complained of a disagreeable sense of warmth in the skin.

On the favorable side there was the apparent effect of the oxygen therapy on the intestinal tract. After the sixth day the abdominal distension disappeared, the walls became soft and pliable, the patient passed flatus freely and soon began to have daily, spontaneous, easily expelled bowel movements.

Finally it seemed reasonable to believe that such oxygen therapy could not have been harmful, when a patient who had been so critically ill at the beginning of treatment could look so splendidly well at the end of fourteen days of such therapy. However, because of the above mentioned objectionable symptoms, it was decided now to withdraw the supplemental oxygen therapy cautiously, not knowing how the human organism would react during quick withdrawal. Therefore the time the oxygen mask was off was gradually increased from six to twelve hours without any deleterious effect.

Now, instead of dispensing with oxygen therapy as quickly as possible (since cyanosis was no longer present), it was decided to continue oxygen therapy on theoretical grounds, for as many hours a day (up to twelve hours) as the patient would tolerate it.

Since the process of healing of cardiac infarcts, following coronary artery occlusion, is characterized during the first few days by a liquefaction necrosis of the muscle fibres, followed by the ingrowth of connective tissue fibres and new blood vessels, I reasoned that a supplemental supply of oxygen should facilitate tissue repair and possibly reduce the amount of muscle necrosis.

Therefore, since the patient had become well trained in the use of the oxygen mask and was exceedingly cooperative, I explained my theories to him and asked him to aid me in this experiment. This he consented to do.

The patient took oxygen by the B. L. B. mask for the next seven days, namely, up to the twenty-first day of his illness, in decreasing daily amounts, from eleven to ten to nine hours. It gradually became apparent that, since the disappearance of the cyanosis, the patient did not tolerate oxygen therapy as readily as he had done previously. He complained of a disagreeable sense of bodily warmth when the mask was on and desired extra coolness and ventilation in his room. Some of these complaints seemed to be nervous because when most of the oxygen was given at night and the patient received an injection of morphine sulphate, grains 1/6, by hypodermic, before the mask was applied, he got through the night fairly well and slept at long intervals.

By the twenty-first day it was felt that the necrotic process in the infarct was no longer going on, and that the connective tissue repair was in full swing, so that on theoretical grounds supplemental oxygen would no longer be necessary. So it was planned to wean the patient gradually from his supplemental oxygen supply.

For the next two days the hours under the B. L. B. mask were cut from nine to six hours without any untoward incident. For the next five days the hours under the mask were cut to three in each twenty-four-hour period. Oxygen was usually given for three hours each evening, always preceded by an injection of 1/6 grain of morphine sulphate by hypodermic.

By this arrangement the patient was freed from the annoyance caused by the long continued use of the mask and usually slept quietly for the ensuing three hours.

On the twenty-eighth day of his illness, all oxygen therapy was terminated without any apparent deleterious effect. With the stopping of the oxygen the daily hypo-

dermic injection of 1/6 grain of morphine sulphate was also stopped. Following the stopping of the morphine no craving for the drug or "withdrawal symptoms" appeared. The patient did not receive or appear to need any more morphine.

Patient's Condition at End of Four Weeks

Four weeks after the onset of an attack of acute coronary artery occlusion, treated by flat bed rest and continuous oxygen therapy by the B. L. B. mask, the patient appeared to be in good physical condition. The color of his cheeks had been "ruddy" from the fourteenth day on. His blood pressure was 140/74; heart rate was between 54 to 60 beats per minute, rhythm regular. The apical first tone which was formerly muffled and distant in character had increased in force and definition. The walls of the belly were soft and pliable and patient had had one to two soft, spontaneous stools daily since the end of the first week. Such a relaxed belly, freedom from gaseous distension and spontaneous stools may be attributed to the use of oxygen.

At this time the examination of his blood revealed a hemoglobin of 16.8 gms. (101 per cent), an erythrocyte count of 5,950,000, and a leukocyte count of 13,050, the blood picture of a mild polycythema vera.

That the oxygen therapy did not produce this blood condition is probable from the fact that his hemoglobin on admission was high, 15.6 gm. (93 per cent) and also from the fact that his wife reported that a "ruddy" complexion was his customary appearance.

For the balance of his course the patient received the usual orthodox treatment of graduated sitting up and graduated walking. He was transported to his home by ambulance on the forty-ninth day of his illness, where he continued his schedule of slow rehabilitation.

At the end of three and a half months from the onset of his illness, he appeared to be pretty completely restored to his usual health. The patient was last seen July 22, 1940, at which time he appeared to be well. He stated that he worked every day and experienced no heart pain, dyspnea, swelling of the ankles, or undue fatigability. His blood pressure was 160/80, and his heart rate was sixty beats per minute; the rhythm was regular and no murmurs were elicited.

A paper by Drs. Mallory and White of Boston, on "The Speed of Healing of Myocardial Infarction" which appeared in the *American Heart Journal* for December, 1939, lends some credence to the theory on which the long continued use of oxygen therapy was applied in this case. They studied the hearts of seventy-two human patients who showed a myocardial infarct at autopsy, such cases having been thoroughly studied before death. In practically all of these cases there was a moderate to a marked degree of generalized athero-sclerosis of the coronary arteries in addition to that in the occluded branch. Thrombi were found in 70 per cent of the cases.

They observed that the first results of stoppage of blood supply to a portion of the myocardium was a necrosis of muscle fibres, and to a lesser degree, of the connective tissue fibres and blood vessels. These signs were first recognizable as early as five to six hours after stoppage.

They found that usually there was a thin layer of surviving tissue 0.3 to 0.5 mm. in thickness along the endocardial surface, the infarcts usually occurring in the middle of the ventricular musculature. Polymorphoneuclears were seen to infiltrate quickly the infarcted area. The purpose of their presence was not clear, but it was believed that they produced an enzyme which aided in the breakdown and phagocytosis of muscle fibres.

By the end of the fourth day newly-formed blood capillaries and connective tissue cells were found growing into the infarcted area. By the end of the tenth day the ingrowth of newly formed connective tissue fibres and newly formed blood vessels had become quite marked. The process of this ingrowth started at the periphery and extended centrally. By the end of the second week the muscle fibres were almost completely removed from small infarcts (i.e. 3 to 4 mm. in diameter).

During the third week the removal of muscle fibres was still going on in large infarcts.

The first signs of collagen formation were found in the form of fine collagen fibres. These were first produced by fibroblasts at the periphery.

From the fourth to the sixth week the age of the infarct was largely dependent on the amount of collagen present, and therefore an actual dating was impossible. In conclusion they stated that the rate of healing depended upon the size of the infarct, its location, and the patency of the surrounding arteries. They observed that the rate of healing was slower where there was a diffuse coronary sclerosis (relative anoxemia C.N.H.) than if the other vessels were of normal calibre.

Summary and Conclusions

By this experimental study I have attempted to demonstrate that 100 per cent oxygen therapy can be tolerated by the human being for long hours daily, day after day, without any apparent harmful or deleterious effect, and that its use is valuable in relieving the pain of acute coronary occlusion and the accompanying state of shock and cyanosis.

I cannot, of course, know what, if any, beneficial effects such supplemental oxygen therapy had on the ultimate size of the infarct or on the acceleration of the healing.

According to the studies of Drs. Mallory and White, the ingrowth of new blood vessels appears early, i.e. the fourth day, and is quite marked by the tenth day. Certainly where tissue repair is going on so actively, an abundant supply of oxygen should aid such tissue repair.

The use of 100 per cent oxygen certainly did not harm this patient, and the evidence probably suggests that death was prevented and the healing was accelerated. Certainly the patient was more comfortable as the result of relief of pain and relief from the secondary ill-effects of anoxemia.

Supplemental Notes

Since the presentation of this paper, I have had the opportunity of reviewing studies of Dr. Clark and his associates (*Anatomical Record,* Vol. 50, 1931, page 129) on "The Rate of Ingrowth of New Blood Vessels into Standardized, Transparent Chambers Placed in the Living Rabbit's Ear." Their observations on the rate of ingrowth of new vessels parallels to a remarkable degree the rate of ingrowth of new vessels as observed by Drs. Mallory and White in their study of "The Speed of Healing of Cardiac Infarctions." Therefore it seems that a brief abstract of Dr. Clark's work should be included here.

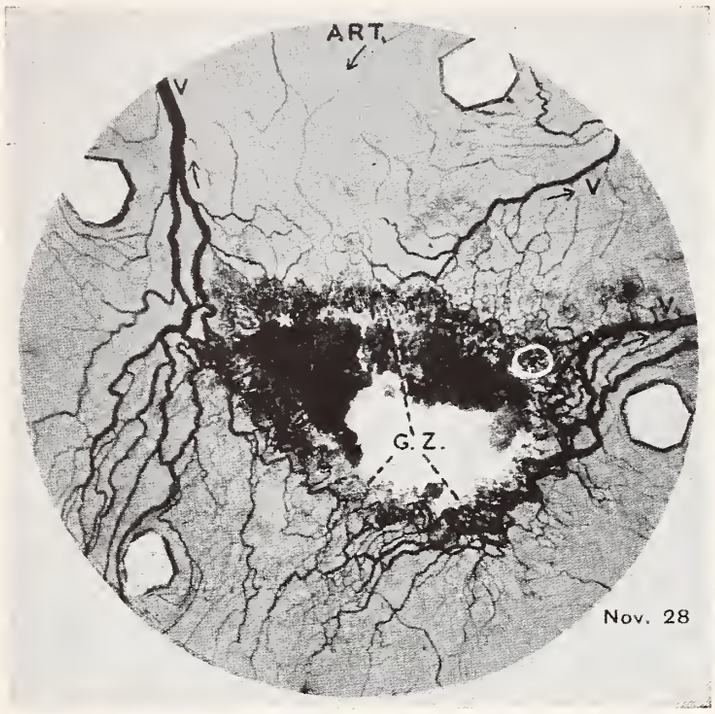


Fig. A. Photomicrograph of the transparent chamber in a living rabbit's ear taken fifteen days after installation and ten days after appearance of new capillaries at the periphery. (From Clark and Clark, Am. Jour. Anat., 55:410, 1934.)

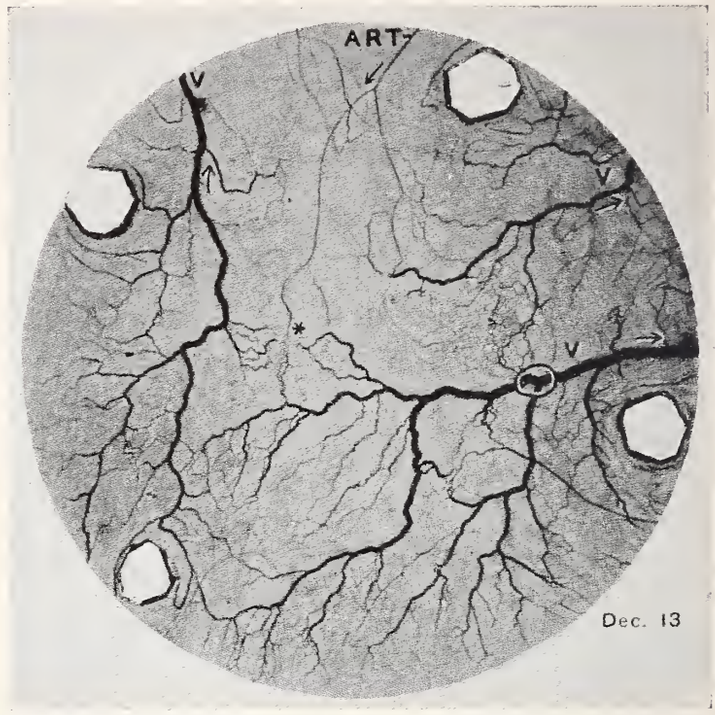


Fig. B. Photomicrograph of the same area as shown in Figure A taken one month after the installation of the transparent chamber. The area is completely vascularized and the vessel pattern has become stable. (From Clark and Clark, Am. Jour. Anat., 55:411, 1934.)

The chambers were so placed in the rabbit's ear that there was a vacant space between the upper and lower tables varying in depth from 40-75 mu. Their observations were based on the placement of sixty standardized chambers and in many instances these chambers were studied daily, and in some instances their observations continued over a period of a year.

They observed that shortly after the installation of the window the vacant space between the tables was filled by blood serum, fibrin, erythrocytes, and leukocytes. Into this amorphous mass new capillaries were first seen to appear at the edge of the chamber between the fifth and ninth days after the installation in some instances, but in the majority the ingrowth of vessels began on the seventh day. These new vessels appeared to arise from pre-existing blood vessels outside the chamber by means of endothelial sprouts which quickly anastomosed to form loops.

The process of sprouting and loop formation continued (Fig. A) until the advancing networks from opposite sides were seen to coalesce, and now the whole space in the transparent window was covered by a vascular plexus (Fig. B). While this advance in the capillary plexus was going on, those vessels at the edge of the chamber which had first appeared, were seen to undergo a differentiation, gradually changing from capillaries into arterioles and venules.

The length of time required for complete vascularization of the window in the rabbit's ear varied in a few instances from sixteen to thirty-five days, but in the majority of cases studied, the vascularization was completed on an average for the entire series, of twenty-three days.

The authors observed that the manner in which new blood vessels grow into the transparent window in the living rabbit's ear corresponds in all essentials to the process of early growth of blood vessels in the embryo, as was shown by the injection studies of Evans ('09) as well as by the studies of Clark ('18) on "The Growth of Living Capillaries in Amphibian Larvæ."

Discussion

Dr. J. A. Lepak, Saint Paul: I think Dr. Hensel should be congratulated on his excellent result. I have used oxygen, like others treating heart disease, for coronary thrombosis. And, as Dr. Hensel recited the findings in his case, I recalled a case in which oxygen therapy was employed for about four weeks. Since the patient objected most strenuously to the mask, the tent was used.

Briefly, in the Spring of 1937 he had an attack of coronary thrombosis. After six weeks he left the hospital and several weeks later he returned to work. In October, 1937, he underwent an operation for an acute empyema of the gallbladder. On the 10th day after the operation, he developed pulmonary embolism involving a large part of the right lower lobe. In three or four months he was quite well again until the fall of 1939 when he had another coronary occlusion, so severe that he went into shock and developed an acute

bilateral hydrothorax. The fluid from the left pleural cavity disappeared shortly, but from the right side it had to be aspirated every seven to ten days for sixteen times for the relief of dyspnea and pain. During this three-month stay in the hospital, it was necessary to give him oxygen most freely. For the first four or five weeks, I do not know of anything that might have given him more relief, especially for pain. Today he is up and about, free of pain, but not free from some fluid in the right pleural cavity.

Recently consulting the Mayo Clinic, he was informed that the fluid in his chest was secondary to his cardiac condition. Despite all measures to eliminate it, it recurs.

This case, however, showed me very forcibly what oxygen can do, and I have no hesitation in commending its use in concentrated dosage over a long period in coronary thrombosis.

The meeting adjourned.

A. G. Schulze, M.D.,
Secretary.

The examination of familial contacts of tuberculin-positive children between the ages of six months and six years, may be a valuable case-finding procedure, since the opportunity for tuberculous infection among very young children is limited to the immediate family circle. Paul Phelps, M.D., et al., *Jour. Pediatrics,* Oct., 1940.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

HUGH YOUNG—A Surgeon's Autobiography. 554 pages. Illus. Price, $5.00, cloth. New York: Harcourt, Brace & Co., 1940.

FOREIGN BODIES LEFT IN THE ABDOMEN. The Surgical Problems—The Legal Problems. Harry Sturgeon Crossen, M.D., School of Medicine, Washington Univ., and David Frederic Crossen, LL.B., School of Law, Washington University, St. Louis, Missouri. 762 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1940.

METHODS OF TREATMENT. Logan Clendening, M.D., Clinical Professor of Medicine, Medical Department of the University of Kansas; Attending Physician, University of Kansas Hospitals; and Edward H. Hashinger, A.B., M.D., Clinical Professor of Medicine, Medical Department of University of Kansas; Attending Physician, University of Kansas Hospitals; Attending Physician, St. Luke's Hospital, Kansas City, Mo. 997 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1940.

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FEEDING THE PREMATURE BABY

(Continued from Page 34)

volume by boiling and adding 2 per cent of calcium caseinate (Casec) may have a beneficial effect.

Rectal temperatures should be discontinued with the first sign of diarrhea—the insertion of the thermometer seems to induce bowel movements. Axillary temperature must be resorted to.

Another complication common to prematures is anemia. They tend to develop a low hemoglobin very easily. A hemoglobin determination should be made no later than the fifth week of life, and if low should be repeated weekly. Some form of iron administration should be followed, beginning at the latest by the fifth week of life. Liver extract and/or ferric ammonium citrate with or without copper sulphate have given a very satisfactory response. The infant may receive each day one c.c. of a 10 per cent solution of ferri et ammonii citras for each pound, or 2 c.c. for each kilogram of body weight, and one-half per cent solution of cupri sulphas per pound or one c.c. per kilogram of the body weight. Both preparations are placed in the breast milk or in the feeding formula. The copper is discontinued after a short period of administration and is given for short periods in intervals. Clinical investigations are now in progress in order to determine a more effective method of combating the anemia of premature infants. These studies may lead to further modifications in the type of food and method of feeding of the baby born prematurely.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 24 FEBRUARY, 1941 No. 2

THE MALMROS-HEDVALL LESIONS OF PULMONARY TUBERCULOSIS IN ADULTS*

A. T. LAIRD, M.D.
Nopeming, Minnesota

THE recent decline in tuberculosis mortality and morbidity and the consequent decrease in tuberculous infection has brought opportunities for studying the beginnings of tuberculosis in the human body that were never before present.

Large numbers of people reach adult life without infection, become primarily infected and eventually develop the adult or re-infection type of pulmonary tuberculosis. This, today, is occurring under our very eyes with the conditions for observation almost as well controlled as they would be in an animal experiment.

The adult or re-infection type of pulmonary tuberculosis is responsible for most of the cases of chronic invalidism or death that result from infection with tubercle bacilli. Only a small percentage of all persons who acquire a primary infection develop this serious form of clinical disease, but when the re-infection type of pulmonary tuberculosis does result, it is always a matter of serious concern and it is extremely important, both from the individual and the public health standpoint, that the diagnosis be made as early as possible.

The presence of this type of the disease may now be determined in certain cases, by the use of the newer methods, long before the patient shows any outward indication of illness or has even a premonition that his health is not perfect.

This has been demonstrated by careful continued studies of large groups of young people who have reached adult life without having been previously infected with tubercle bacilli. Such persons readily acquire a primary infection when exposed to tuberculosis and later a certain proportion of them acquire serious clinical disease in the form of re-infection type of pulmonary tuberculosis.

Opportunities for infection are greater for those studying medicine or nursing, and especially for those who come in close contact with tuberculous patients. A much larger percentage of such students acquire infection. Consequently, a relatively large number of cases of serious progressive pulmonary tuberculosis may be found in such groups. The occurrence of such cases of clinical disease may even be anticipated under such circumstances, and if the entire group is under careful and continuous observation the very earliest manifestations of the illness may be detected.

One interesting study of such a group is that recently reported by Malmros and Hedvall.*

They made systematic examinations of 3,336 students at the University of Lund in Sweden and found 133 cases of definite active tuberculosis.

Their investigations were begun in 1930, and included tuberculin testing, fluoroscopy, the taking of x-rays, and the making of sedimentation tests. Even in the tuberculin negative cases, x-rays were taken as a rule. All cases were checked at least once a year. The cases which became tuberculin positive during the period of observation were checked especially carefully and x-rays were taken of them from two to four times a year, for the following two to four years, even if at first no changes could be found in the lungs. This work could be carried on in this way be-

*Read before the St. Louis County, Minnesota, Medical Society, at Nopeming, Minnesota, May 9, 1940.

*Studien über die Entstehung und Entwicklung der Lungentuberkulose. Published in 1938, Johann Ambrosius Barth, Leipsig.

cause of the fact that special funds were available for x-rays and it was possible to take an unusually large number. In all, more than five thousand were taken, including routine and special films. As a result, a valuable and readily accessible collection was secured for permanent filing and study. In many of the series of x-rays in which at first the findings were normal, Malmros and Hedvall were able to study the beginnings and the later development of the re-infection type of pulmonary tuberculosis.

As already mentioned, 133 cases of definite active cases of adult type tuberculosis were found among the 3,336 students and pupil nurses examined, which makes about 4 per cent of the entire number. Of the 133 cases, sixty-nine were medical students and twenty-four were nurses.

For the purpose of studying the development of tuberculosis in adults, the entire number of cases studied was divided into three groups:

Group I (forty-seven cases).—In this group, those cases of adult type pulmonary tuberculosis were included, which at the beginning of the investigation showed definite negative tuberculin reactions and in which the beginning of tuberculosis and in many cases the entire development into open tuberculosis could be studied.

Group II (forty-three cases).—In this group were included the cases in which the tuberculin test was already positive when the study was begun, but in which a normal chest x-ray was available before tuberculosis developed in the lungs.

Group III (forty-three cases).—In this group, finally, are found the remaining cases, those in which tuberculous infection had already been indicated by a positive tuberculin reaction and by some evidence of tuberculosis in an x-ray of the chest previous to the time when active disease developed.

Group I

Group I is naturally the most important of the three groups since by a study of the forty-seven cases included in it, one can really learn to recognize the changes which occur in primary tuberculous infection and also the later development of the adult type of tuberculosis. Six hundred and four, or approximately 18 per cent of the 3,294 students given the tuberculin test, at first showed negative reactions. Of these 604, the number that changed from negative to positive during the period of observation (1930-1938) was 151, or 25 per cent. Of those whose susceptibility to tuberculin changed in this manner, 104, or about 69 per cent, became positive reactors without ever developing any other signs or symptoms of tuberculosis than the positive tuberculin reaction itself. In the other forty-seven cases (31 per cent) tuberculous changes sooner or later were demonstrated in the lungs. They comprised Group I.

All of these forty-seven patients had had a negative tuberculin reaction and a negative x-ray when first examined. The positive reaction occurred on an average nine and a half months after there had been a negative one; in half the cases in four months and in two cases in two weeks.

Of the forty-seven patients, nineteen developed definite childhood type (primary infection type) tuberculosis of the lungs with the usual primary complex. Six others developed pleurisy only, without a primary complex. Nine others developed various conditions which the authors considered indications of a primary infection including erythema nodosum, phlyctenular conjunctivitis, gland tuberculosis and miliary tuberculosis. Of these thirty-two patients developing primary type tuberculosis, nineteen recovered without further illness during the period of observation, the patient with miliary tuberculosis died, two developed peritoneal tuberculosis, one a marked hilus infiltration, and five of the thirty-two later developed typical re-infection or adult type tuberculosis, one of whom died. Of the entire group of thirty-two patients ill with primary type tuberculosis, twenty-one were hospitalized, and six required pneumothorax treatment.

As will be noted in this group of thirty-two patients who had evident primary tuberculosis, there were five who later developed the re-infection or adult type of pulmonary tuberculosis. Besides them there were fourteen others who developed the adult or re-infection type without having shown any previous evidence of the disease except changing from a negative to a positive reaction.

Altogether nineteen of the forty-seven cases of clinical tuberculosis eventually developed adult type tuberculosis. One died, and five required pneumothorax treatment.

In the cases of primary pulmonary infection in

adults above mentioned, there had been in the majority of cases some general symptoms such as fever, pain in the side and cough. The blood sedimentation rate was usually increased.

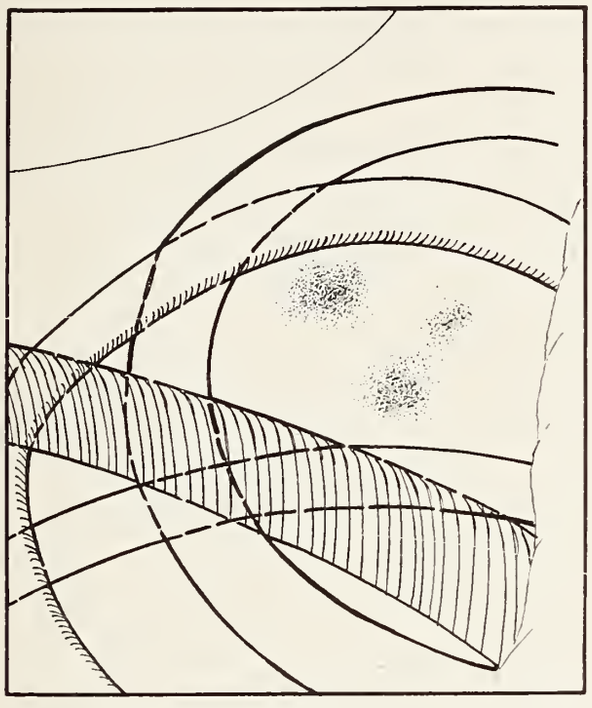


Fig. 1. Subprimary initial lesion. (Diagrammatic sketch by James Wing.)

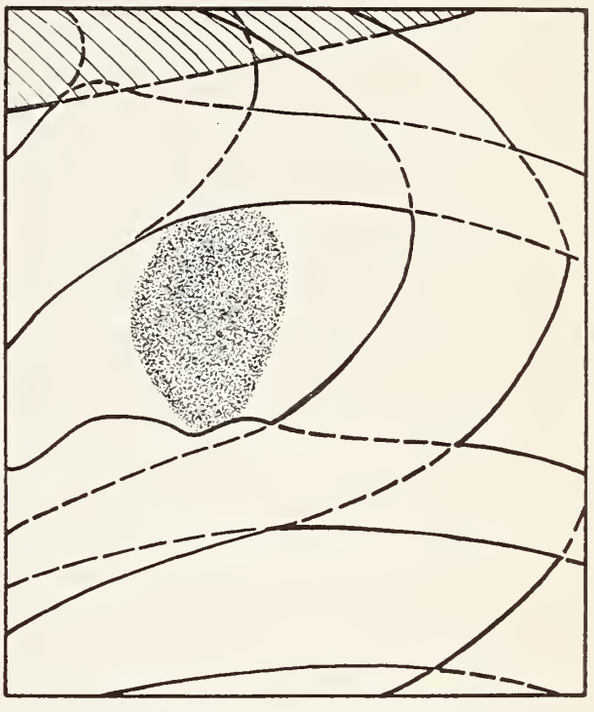


Fig. 2. Early infiltrate. (Diagrammatic sketch by James Wing.)

On the other hand, in the majority of the cases in which the re-infection type of tuberculosis of the lungs developed later, there were *no subjective symptoms of illness* such as had been noted in connection with the primary infection. *Moreover the sedimentation test was normal in most of these cases.*

The re-infection or adult type of pulmonary tuberculosis in those primarily infected in adult life usually began with a lesion called by Malmros and Hedvall a "subprimary initial lesion" which often took the form of single or multiple cloudy spots or flecks on the x-ray film. These in the majority of cases were located in the supraclavicular region or in the first interspace or simultaneously at both places. No special preference for a location below the clavicle could be observed. Assman's teaching that the first lesions of the adult type were usually located below the clavicle was not supported by these findings.

In individual cases an appearance was noted suggesting infiltration, near the area of flecks which the authors designated as "the early infiltrate." Extensive hematogenous dissemination as the first sign of disease was not seen in any case. These "early infiltrate lesions" were denser and their edges more sharply defined than was the case with the "subprimary initial lesions."

These two lesions, the "subprimary initial lesion" and the "early infiltrate," were the first evidences seen of the adult or re-infection type of pulmonary tuberculosis.

Group II

The beginning of the adult or re-infection type of pulmonary tuberculosis was also observed in thirty-seven individuals who at the beginning of the investigation had definite tuberculin reactions but normal x-ray pictures. Six others developed pleurisy and two hilus gland tuberculosis.

The incipient lung tuberculosis in these cases developed in the following forms: in twenty-eight cases larger or smaller "subprimary initial lesions" were demonstrated in the form of somewhat irregular spots or flecks, often fairly sharply defined, but more frequently with edges that faded out and with a tendency to confluence. In one case an isolated "early infiltrate" was present and in one case an isolated cavity in the apex was found.

In this group also, the initial lesions as a rule were supraclavicular or in the first interspace or in both places simultaneously. Here, too, there was found no special tendency for localization in the subclavicular area. In most cases the lesions

showed a progressive tendency in that the process advanced from the apex downward or spread to the opposite lung. In no less than seventeen of the twenty-eight cases showing "subprimary initial lesions," a serious progressive tendency developed later as a result of which cavities developed in ten cases. One of the patients died exactly a year and a half after the "initial lesion" was demonstrated. In two cases the first demonstration of any change from the initial lesion was the appearance of cavities on account of which pneumothorax had to be instituted. The condition in four cases was unstable or slowly progressive. Thirty-six of the forty-three patients in this group were hospitalized; twenty-one received pneumothorax treatment; two died.

The isolated instances of "early infiltrate," which has been shown to be a relatively unusual form of incipient pulmonary tuberculosis of the adult or re-infection type, in the material investigated were located in different sections of the lung; in certain cases they softened and gave rise to cavities, but in others they gradually disappeared by resolution.

A fundamental distinction between these various forms of incipient pulmonary tuberculosis can hardly be made. The designation "early infiltrate" may be used in those cases where the process begins as a larger well limited density.

Extensive hematogenic spreads could be demonstrated by the x-ray in the series only in individual cases and in acute miliary tuberculosis.

Whether the incipient pulmonary tuberculosis began as the smaller flecks ("subprimary initial lesion") or as an "infiltrate" without accompanying areas of flecks, there were in general *no subjective symptoms* nor *any increase of blood sedimentation rate.*

There were forty-three patients in this group in whom definite new lesions of adult type tuberculosis developed. Of these, thirty-seven were hospitalized, eighteen received pneumothorax treatment and three died.

Group III

In the study of these cases, which had all shown some roentgenologic changes during their investigation, there were frequently indications that they had recently developed in new areas the "subprimary initial lesion" which we have described as the commonest form of beginning pulmonary tuberculosis of the adult type, especially when spreading occurred or when new lesions appeared in the opposite and previously normal lung. Such fresh lesions were similar to those already described.

The initial lesion may naturally remain stationary for a long time or even show retrogression. Often there remain traces in the form of sharply contoured, opaque, small flecks, which for some time have been known as Simon's lesions. Exceptionally, the tuberculosis process may light up again from such foci. In some cases there may be little change in a small lesion for several years, after which rapid extension of the disease may occur.

It is of the greatest practical importance not to overlook these early "subprimary initial lesions" or underestimate their importance. They should be anticipated and especially looked for in exposed persons. The lessening cost of chest x-rays will soon make it possible for physicians to have films taken at frequent intervals in all such cases. These should ordinarily be submitted to competent roentgenologists for interpretation. Since evidences of previous primary infection cannot always be demonstrated, it is as Malmros and Hedvall have stated—sometimes impossible to determine positively whether the lesions found are due to primary infection or re-infection.

No pulmonary lesions in adults whether thought to be due to primary infection or to re-infection should be treated casually on the assumption that primary cases have a benign prognosis. The lesions that are evidently due to re-infection are especially uncertain in their course and may cause serious and extensive disease.

The following cases taken from Malmros and Hedvall's report showed the initial lesions of the re-infection type of pulmonary tuberculosis. To them we have added a series of cases observed at Nopeming or in the Duluth hospitals.

Cases in Sweden

Group I

Case 34—Medical student, born 1909.

Mantoux test (1 mg.) negative January 1, 1934, and x-ray of chest negative. Von Pirquet test positive September 21, 1934. Sedimentation test twenty minutes. The patient had recently felt chilly. X-ray showed ill-defined cloudy flecks in the left supraclavicular area. Hilus negative. In a radiograph taken February 21, 1935, the flecks were more marked. The patient was treated at home. At first there was retrogression of the lesion. By March, 1936, there was slight progression on the left side in the supraclavicular area. Ex-

amination of gastric contents showed the presence of tubercle bacilli. For a year the condition was stationary, then further progression occurred on the left in the first interspace, while the changes in the apex were less evident. Now thread-like shadows and flecks appeared which became confluent. The x-ray taken December 12, 1937, showed the flecks for the most part softened into an infiltration in which a central cavity appeared. Sanatorium treatment was given. The patient now feels entirely well.

In this case the "subprimary initial lesions" appeared in the left apex without any demonstrable primary complex, eight months after a negative tuberculin reaction. The case had been under observation four years.

Case 36.—Pupil nurse, born 1914.

Mantoux test negative on June 6, 1934, and x-ray of chest also negative. On February 21, 1938, the Mantoux test was positive. The patient had no symptoms but an x-ray showed apical changes on both sides above the clavicle and in the first interspace, consisting of numerous small, ill-defined flecks. In addition, on the left side there was a cavity (10 x 10 mm.) which showed much larger on the x-ray taken on May 5, 1936. Accordingly the left lung was collapsed by pneumothorax. Later there was extension of the lesions on the right side which necessitated sanatorium treatment and pneumothorax treatment on the right side. Tuberculosis of the peritoneum developed later.

The "subprimary initial lesions" with cavitation developed in this case in the apex and upper lung areas about a year and a half after a negative tuberculin test. About ten months later, peritoneal tuberculosis developed. There was no demonstrable primary complex. The case was under observation three and one-fourth years.

Nopeming Cases

Group I

Case 18859 (St. Luke's No. 11701). F., aged nineteen (1936), student nurse. No tuberculosis in family. Mantoux test negative in 1936 and 1937. Stereoscopic lung radiograph June 4, 1936—negative. Lung radiograph April 28, 1937—negative. The patient worked on tuberculosis service in January and February, 1938.

Radiograph taken January 19, 1938, revealed a small area in the right apex at the junction of the upper margins of the clavicle and first rib. This was a spot or fleck about 1 cm. in diameter together with delicate streaks and mottled areas. Stereoscopic radiograph January 20, 1938, revealed the lesion more clearly. The patient had no symptoms. Radiograph taken October 5, 1938, rather unsatisfactory but was interpreted as negative.

Radiograph May 26, 1939, revealed an infiltration extending downward from the original lesion into the first and second interspace, consisting of soft streaks and mottled areas. The patient was asymptomatic. Radiograph June 3, 1939, showed no change. Radiograph July 7, 1939—slight change. The patient graduated in June, 1939, and worked until January, 1940, when she had hemorrhages.

Stereoscopic radiographs January 9, 1940, revealed slight contraction of the lesion with a hazy infiltration at the second right interspace. The patient was hospitalized and pneumothorax was induced on the right side. Tubercle bacilli have not been demonstrated.

Group II

Case 1625E (986 O.P.).—F., aged twenty-three (1932), graduate nurse employed at the sanatorium. Mantoux test was positive at the beginning of employment. Radiographs were taken at this time. Those taken on December 19, 1929, October 15, 1931, and November 25, 1932, were negative except for a calcified Ghon tubercle near the right cardiophrenic angle.

Routine radiograph November 28, 1933, revealed a minimal involvement in the left lung consisting of "flecks" at the level of the second rib and second interspace. The patient had no symptoms. She remained on duty. Radiographs taken July 8, 1934, and December 30, 1934, showed contraction of the lesion which now appeared as fine streaking at the second interspace. In April, 1935, the patient complained of a slight dry cough and weight loss.

On April 13, 1935, radiograph now revealed an increase in the lesion consisting of a cloudy infiltration in the first and second interspaces. The patient was hospitalized and rapidly lost symptoms. She was unable to raise sputum. Radiographs taken May 16, 1935, and June 1, 1935, showed rapid clearing. The patient was allowed to go home for rest and returned to duty September 1, 1935.

On October 3, 1935, radiograph revealed a fairly fibroid lesion as residue. Frequent radiographs to date have shown slow contraction of the lesion.

Radiograph taken January 1, 1940, shows the present status of the lesion, which does not appear to be active.

Group III

Case 2286.—M., student, aged twenty (1933).

The mother had tuberculosis with positive sputum. The patient was in excellent health, and played on college football, basketball and hockey teams.

Radiograph taken April 9, 1933, revealed calcified glands and a Ghon tubercle in the left lung. In the first and second interspaces on the right there were scattered "fleck-like" areas. The patient had no symptoms but was reëxamined May 7, 1933, and June 5, 1933.

On June 5, 1933, radiograph showed conglomeration of the mottling with a spot of increased density 1.5 cm. in diameter at the second right interspace. The left lung was unchanged. The patient was advised to enter a sanatorium but refused and continued school work. There were no symptoms. He did not return for further examinations until December.

Radiograph taken December 17, 1933, revealed increase in the lesion with a cavity at the second right interspace 1.5 cm. in diameter. The patient complained

of a cold, but refused treatment. Radiograph January 17, 1934, showed very little change

The patient's condition was again checked by x-ray March 3, 1934, which now revealed a marked atelectatic or pneumonic area involving the lower half of the upper lobe. Cavity was patent. The patient had very slight symptoms. Sputum was positive.

Pneumothorax was induced March 17, 1933, with good collapse. The patient was discharged with pneumothorax June 30, 1934. The lung was reëxpanded in November, 1936. The patient's last check-up, August 21, 1938, showed a fibroid and calcified area in the region of the original disease, apparently not active. Recent report (1940) is that he is in excellent health.

THE VOLLMER PATCH TEST AND THE MANTOUX TEST

F. M. FELDMAN, M.D., Dr.P.H.,*
Rochester, Minnesota
in collaboration with
A. F. RISSER, M.D., and E. R. SCHWARTZ, M.D.
Stewartville, Minnesota

IN 1937, Vollmer and Goldberger[9] first reported on the patch test used in this survey. In the 209 cases they tested, the patch and Pirquet tests were in conformity in 89 per cent. No Mantoux tests were done. In 15 cases the patch was positive and the Pirquet negative, and in 7 the reverse was true.

Taylor[7] tested a group of nurses, medical, law, and engineering students using the Vollmer patch and 0.1 mg. O.T. Mantoux tests. Of the 744 tested, 511 were negative to both tests, 191 positive to both, 27 positive to the patch test and negative to the Mantoux, and 15 negative to the patch test and positive to the Mantoux. He concluded that the patch test was as effective as the Mantoux with 0.1 mg. O.T.

In 880 tests on school children, Peck and Wegman[5] were able to obtain only ninety-four positive patch tests on the 319 individuals who had reacted to Mantoux tests done with first and second strengths purified protein derivative (P.P.D.).

Weiner and Neustadt[11] using a different approach gave Mantoux tests with 1:1,000 O.T. only to those who reacted negatively to either or both the patch and Pirquet tests. Only 3 of 60 reacting negatively to the patch and Pirquet tests reacted to the Mantoux. Of the 10 positive to the patch only, 7 reacted to the Mantoux. And of the 3 positive to the Pirquet only, one reacted to the Mantoux.

Vollmer and Goldberger[10] gave patch tests and Mantoux tests with 0.1 mg. O.T. simultaneously to 417 children on a general pediatric service. In this group 28 were positive to both tests and 385 negative to both tests. The tests disagreed or were questionable in only 4 cases.

Court[1] reported 100 per cent correlation between the Mantoux with 0.1 mg. O.T. and the patch test in 110 children, but Mantoux tests were read as negative if the induration was less than 10 mm. in diameter.

In testing 91 tuberculous children and 5 adults at a sanatorium, Steward[6] observed 90 reactions to both the patch and 0.1 mg. O.T. Mantoux, 6 reactions to the patch test alone, and none to the Mantoux test alone.

Of 536 children tested by Hart,[2] 436 had negative reactions to the Vollmer test patch and a Mantoux test with 0.01 mg. O.T., and 97 had a positive test to both. In only 3 instances was there disagreement.

Hughes[3] found that of 78 children positive to the Mantoux with first strength P.P.D., all were positive to the patch test. And of 22 positive only to second strength P.P.D., 11 had a positive patch test.

Of 712 children tested by Pearse, Fried, and Glover,[4] 492 were negative to the Mantoux test using first and second strengths P.P.D. and the patch test, 35 were positive to both, 67 were positive to the patch test alone, and 21 to the Mantoux test alone. In this study the patch test gave 7 per cent more positives than the Mantoux.

All investigators agree that the patch test has certain definite advantages in that it is painless, involves no instruments or sterilization, and never leads to a severe local or general reaction. Furthermore, the test material keeps its potency for months.

During the first part of April, 1940, Mantoux

*Director, District No. 3, Minnesota Department of Health.

tests and tuberculin patch tests (Vollmer) were given simultaneously to approximately 300 students, teachers, and employes of the schools at Stewartville, Minnesota. Although the number of tests here reported is too small for any definite conclusions to be reached, such experience may be of value when added to that of other investigators.

For the Mantoux tests, 0.1 c.c. of 1:1,000 O.T. was injected intracutaneously on the anterior surface of the right forearm. The tuberculin was obtained from the Division of Preventable Diseases, Minnesota Department of Health.

The patch tests were applied to the right or left of the spine in the scapular region after the skin had been cleansed with acetone. The patch test material was purchased on the open market and was manufactured by the Lederle Co.

The Mantoux tests were read at the end of 48 hours and the patches were removed at that time. The patch tests were read at the end of another 72 hours rather than 48 hours because of an intervening Sunday, and it is possible some of the weaker reactions may have faded over this time. X-ray plates of all reactors were made at the Mayo Clinic, Rochester.

As is evident from Table I, the patch test was negative in all 16 persons having a one plus Mantoux reation, and on three of the four with a two plus Mantoux reaction. All of those with three plus Mantoux readings, however, had definite patch test reactions. Only three persons had a positive patch test with a negative Mantoux.

TABLE I. TUBERCULIN TEST RESULTS BY AGE

Mantoux Test	Neg.		1+		2+		3+				
Patch Test	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Total Tested	Total Pos.	% Pos.
Age 5–9	2	66	0	2	0	1	0	0	71	5	7.0
10–14	1	97	0	2	0	0	3	0	103	6	5.8
15–19	0	82	0	11	0	1	1	0	95	13	13.7
20–29	0	3	0	1	1	0	1	0	6	3	50.0
30+	0	6	0	0	0	1	4	0	11	5	45.5
Totals	3	254	0	16	1	3	9	0	286	32	11.2

TABLE II. TUBERCULIN TEST REACTORS AND X-RAY RESULTS

Mantoux Test	Neg.		1+		2+		3+		
Patch Test	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Total
Calcified Area in Lung	0	0	0	0	1	0	0	0	1
Ghon Complex	0	0	0	7	0	1	6	0	14
Calcified Hilus Glands	2	0	0	1	0	2	1	0	6
Negative	1	0	0	7	0	0	2	0	10
Totals	3	0	0	15	1	3	9	0	31

It would appear that the patch test is unreliable for indicating tuberculin sensitivity below the level which will produce a three plus Mantoux reaction with 0.1 mg. O.T.

In Table II, x-ray findings have been correlated with the tuberculin test results. Although some of the Mantoux tests read as one plus were doubtful positives, this table reveals that eight had definite x-ray evidence of infection. It should also be noted that all three with negative patch tests and two-plus Mantoux tests had x-ray signs of primary tuberculosis.

Tuberculin tests, especially in surveys of this nature, are used primarily as a screen to indicate individuals most likely to exhibit open active tuberculosis on further examination. In this instance, no active cases were found, and in most studies reviewed no mention was made of the relative effectiveness of the Mantoux test and the patch test in this respect, although Vollmer[8] did state in a popular article that of 847 children admitted to Mt. Sinæ Hospital, there was only one case with clinical, roentgenographical, or bacteriological findings indicating a tuberculous infection that failed to react to the patch test. This was a child with miliary tuberculosis in whom the Mantoux test with 1.0 mg. O.T. was also negative. In this article he also reported a mass examination of 613 high school students carried out by the New York Health Department with the Mantoux, patch test, and x-ray examinations in which no significant lesions were missed if the patients failed to react positively to either the patch or Mantoux test.

It may be that the patch test will prove to be practical even if those with slight sensitivity to tuberculin are missed. Before this question can be answered, further study of survey end results seems indicated.

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PNEUMONIA IN RURAL COMMUNITIES*

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THE purpose of this paper is not to bring out statistics of a large group of pneumonia cases, but rather to illustrate the marked changes in the treatment of pneumonia which have taken place the last thirty-six years in rural communities in Minnesota.

In the early days of my practice in Rushford, a small city in southeastern Minnesota, more than thirty-six years ago, pneumonia was dreaded more than any other disease, and from early cold weather until late in March, it was the most frequent of all serious illnesses. Calling the doctor was usually delayed by people in the country until the patient had been sick for several days. He was called earlier only when a patient began expectorating a pink colored sputum, or if there were chest pains with a cough. These symptoms were interpreted, then as now, by some member of the family or some neighbor as pneumonia, and it was frequently called "Ammonia on the Lungs." A few of you older men present today will remember the helplessness of the situation. The word "Pneumonia" or "Lung Fever," spread fear into the hearts of the whole household. Moving a patient to a hospital was out of the question. Those were the horse and buggy days. Nurses were few and far between, they were considered more or less of a luxury, and when needed were seldom available. The care of the

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patient was left to members of the family or perhaps some "handy woman in the neighborhood." She usually had a solemn face and often the only order she would and could willingly carry out would be the application of a mustard plaster to some painful part of the chest, or to the side of the chest involved. Orders for sponging or the giving of a general bath to make the patient more comfortable or for the reducing of temperatures were looked upon with horror. Fresh air and baths were considered dangerous for pneumonias, and furthermore the windows had been fastened shut for the winter. Drugs were used in the hope that they would have some value, and the worst tasting mixture was usually given credit for being a very good "Pneumonia Medicine." Quinine was used consistently, and if large enough doses were given it was probably the most valuable drug used. Whiskey was kept handy and in cases in which the pneumonia was terminated by a crisis it was very valuable. In other cases it helped the night watch keep up their courage. Mortality ranged from 15 to 20 per cent throughout Minnesota.

Very little progress was made in the treatment of pneumonia for many years. Better roads and automobile transportation of pneumonia patients to hospitals made some changes for the local practitioner and the patient had better care, but mortality rates were still high. Oxygen undoubtedly tided over a few, provided it was used early and not merely as a last resort, and the most that can be said for oxygen is that it is a sustaining agent and makes the patient more comfortable. Optochin Base, an alkaloid of the cinchona family, was without any doubt in my mind the best anti-pneumococcic drug until the present sulfanilamides came into use. I used it for many years and had more confidence in it than in any other drug, until its dangerous effects on the retina were reported and even blindness followed its use in a very small percentage of cases. Fortunately I had no such accidents. So much for reminiscing.

During a period of fourteen months beginning in February, 1939, and ending in April, 1940, I treated thirty-one patients with pneumonia. For seventeen of these I had the pneumonia typed. The other fourteen had been sick for more than three days before I was called and at that time I could see no very good reason for typing, as far as the treatment with serum was concerned. If I had to do it over again, I would have them all typed. I will come to this question a little later.

The distribution of types was as follows:

No. Patients	Types
2	3
1	4
4	7
2	8
1	9
2	13
1	16
1	17
1	19
1	23
1	32

In eleven of the seventeen cases in which I had the sputum typed I used the anti-pneumococcus serum; in four of these I gave a total of 80,000 units and in seven I gave a total of 60,000 units. In all cases, rabbit serum was used and there was not the slightest reaction in any of the cases. The conjunctival test with rabbit serum was used in all cases in which serum was administered.

In the other six cases that were typed, forty-eight hours had elapsed before I got a report, due to difficulty in typing, and I felt that the time had passed when the greatest amount of good could come from serum administration.

The Minnesota State Board of Health laboratories did the typing in each case, and they give a splendid service twenty-four hours each day, and the only problem in rural communities is to get the sputum specimens to the laboratories with as much speed as possible. Rushford, like many other small towns, is not blessed with too many mail trains, but we have a good highway across to Winona—twenty-one miles away, where there are many fast mail trains, plus bus service. In order to get a report back in a hurry the specimens were either taken to Winona by some member of the patient's family or I had them taken over by messenger and sent special delivery. In a number of cases the report as to type was telephoned to me eight hours from the time the sputum was sent from Rushford to Winona. In the telephone report coming from the laboratory the question was always asked if I wanted serum, and in a number of cases the serum was called for at the bus depot in Winona and brought back and given to the patient within eighteen hours

from the time the sputum was sent to the laboratories.

Getting back now to the fourteen cases I didn't have typed: One of these patients died, the only certificate of death by pneumonia I signed during the fourteen months. The patient was a woman eighty-three years old who had been sick several days before I was called. She didn't take kindly to sulfapyridine and began vomiting following the third dose. I then gave it rectally in solution and, of course, most of it in suspension but it didn't do anything for her. Given this way there is probably very little absorption. Whether she would have survived if her pneumonia had been typed and serum given is a question. In cases like this I believe pneumonia should be typed, for then all the treatment of today could be applied.

The other thirteen patients ranged from two years to seventy-two years and all of them had been sick for more than three days before I saw them. Three of them were brought to the office, including a brother and sister—fourteen and sixteen years old—who had temperatures of over 103 degrees. They were brought in a distance of over nine miles over bad roads. The sister had a stormy time, delayed resolution with an irregular temperature that lasted for more than three weeks. These patients undoubtedly had the same type of pneumococcic infection, but the brother got along very well. The length of his illness was the average; resolution took place normally. Both of them had the same treatment with sulfapyridine. The question in my mind has been, would the sister have had a normal recovery without so much loss of time if she had had the help of serum?

All of the thirty-one patients were given sulfapyridine, and there can be no question as to its value—it has changed the picture of the treatment of pneumonia, provided the patient can tolerate the drug. Four of my patients could not. One of the patients who could not tolerate sulfapyridine was a robust farmer fifty-seven years old who had a type 3 infection. He started to vomit following the second dose and no matter how it was given or with what it was given it seemed like poison to him. His temperature was 104.5 degrees and the greater part of the right lung was involved. Fortunately there was no delay in getting the sputum typed and the first dose of the serum was given to him in eighteen hours from the first time I saw him. He was given 20,000 units every twelve hours for four doses. He responded to this treatment beyond expectations and his temperature dropped to normal a few hours following the third dose. From this time on he made an uneventful recovery.

Only one of the thirty-one patients had a complication and that was a pleural effusion of 36 ounces of a clear fluid. Five of the thirty-one had the care of a trained nurse, three of them full time, the other two part time. All the others were taken care of by members of the family who were given instructions as to general care, keeping a memorandum of temperature readings and the intake of fluids, especially the juice of citrus fruits.

Conclusions

1. Typing should be done in all cases of pneumonia and can be done in all rural communities even though the doctor is not called within twenty-four or thirty-six hours following the onset. It will to some extent give us a clue as to the virulence of the type of pneumonia we are dealing with.

2. The administration of anti-pneumococcic serum according to type is the logical treatment, and even though it is not 100 per cent effective, it can be given with the assurance of some benefit, and in the treatment of pneumonia we need every help possible.

3. Sulfapyridine, if given carefully and judiciously, is without any question the most valuable drug discovered to date for the treatment of pneumonia, provided the patient can tolerate the drug.

4. Pneumonia cases can be typed with speed, and treated with efficiency in rural communities, by country doctors in spite of and without the benediction of Hugh Cabot, who has belittled the value of "country doctors."

CARCINOMA OF THE STOMACH*

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CARCINOMA of the stomach is a lesion which occurs so frequently and which has such grave implications that it should be of interest to all engaged in the practice of medicine and surgery. It has been estimated that approximately 40,000 people die each year in this country alone of carcinoma of the stomach. In a recent report by Livingston and Pack it was stated that in this country carcinoma of the stomach accounted for more deaths than traffic accidents between the years 1923 and 1937. There is some evidence to suggest that malignant gastric lesions are accounting for more deaths each year.

At the present time the only chance to cure carcinoma of the stomach resides in recognition of the disease early enough to permit its surgical removal. Furthermore, from present knowledge the only hope of reducing mortality from this lesion in the future is by establishing the diagnosis early in a higher percentage of cases, so that resection will be feasible in a greater number of cases. Since Billroth's first successful resection for carcinoma of the stomach, performed fifty-eight years ago, many patients have been cured by this means of treatment, but, so far as I know, no patient has been cured by any other form of treatment.

How then is the early diagnosis of carcinoma of the stomach to be established: Fortunately, the means by which this may be accomplished when the opportunity is presented are within the reach of us all. The necessary prerequisites include: (1) a clear appreciation of the early symptoms which may be caused by carcinoma of the stomach, (2) the accurate evaluation of a carefully elicited history, (3) possession of a readily aroused suspicion concerning the possibility of carcinoma of the stomach, and (4) the insistence on a competent roentgenologic examination of the stomach in every possible case. If we wish to establish the diagnosis early in the course of the disease one of the first things we must do is to discard the old textbook picture of carcinoma of the stomach. The symptom complex of gastric carcinoma described in most textbooks includes only the findings of long-standing and advanced lesions. The characteristics of this disease usually mentioned consist of emaciation, palpable tumor, nodules in the liver, and also anemia, cachexia and loss of strength. Obviously, if we wait until this stage of the disease is reached, the patient benefits very little by its recognition.

Several years ago Wilbur described three clinical syndromes, one of which occurs usually in the presence of carcinoma of the stomach. I believe that these syndromes are worthy of emphasis as their recognition is essential in detecting early gastric carcinoma. The first of these is a so-called typical history usually presented by a patient of middle age or older. (It is well to remember that in 8 per cent of cases, gastric carcinoma affects patients forty years of age or less.) Commonly the patient has enjoyed perfect digestion until the rapid onset of dyspepsia. This dyspepsia may consist of anorexia, discomfort after meals, belching, epigastric distress, nausea, and occasionally vomiting. These symptoms usually are progressive and constant in nature, and as time goes on there is loss of weight and strength. A history of this type always should arouse the suspicion of gastric carcinoma and always should demand careful roentgenologic examination of the stomach. A second group of patients presents the so-called ulcer type of history. The patient who presents this type of history may have experienced symptoms similar to those caused by peptic ulcer for a brief or prolonged time. Very frequently these symptoms may then change in one of various ways. There may be disappearance of the customary intermittency of symptoms or alteration of the pain-food-ease sequence so commonly present in cases of uncomplicated peptic ulcer. Food may aggravate rather than relieve the distress and a more or less continuous dull ache may develop in the epigastrium. Nausea and anorexia occur frequently and the ordinary measures which gave relief previously may fail to do so now. The

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possibility that a patient who actually has carcinoma of the stomach may present symptoms suggestive only of benign ulcer renders roentgenologic examination of the stomach imperative before instituting medical treatment in any case of suspected peptic ulcer. A third group of patients with gastric carcinoma may present a "nondescript" type of history. In this group the symptoms referable to the gastro-intestinal tract may be vague, indefinite or entirely absent. They may consist of constipation, bloating, belching, abdominal discomfort or other similar nonlocalizing, rather mild, complaints. Not infrequently the patients may say that they were in perfect health until the occurrence of a recent infectious process such as "flu," and that they have not regained their strength. There may be a gradual loss of weight and strength and the development of anemia. It may be difficult or virtually impossible to establish the diagnosis early in cases in which patients present this symptom complex. From such an individual even the most astute clinician may elicit no evidence suggestive of gastric carcinoma until the lesion is well advanced. It is unfortunate but true that certain carcinomas situated in the stomach make their presence known only after the hope of surgical cure has passed. This fact, rather than being discouraging, however, should make us more on the alert to recognize all those lesions which can be detected while they are still amenable to surgical treatment.

A clear appreciation of these three groups of symptoms which may be experienced by patients with gastric carcinoma is most important in the early recognition of this disease. One of these three definite syndromes may not be present always and various combinations may occur; however, any of these symptoms always should arouse suspicion of the possibility of gastric carcinoma and demand roentgenologic examination. In order not to overlook certain instances of carcinoma it is necessary to perform many roentgenologic examinations of the stomach which reveal only normal findings. This is a matter of small concern, however, considering the benefits that may accrue in cases in which early diagnosis of gastric carcinoma is established.

What then are the factors which lead to the late diagnosis of carcinoma of the stomach? These may be divided into several categories. One of the most important factors remains inherent in the nature of the lesion itself. Unfortunately, carcinoma of the stomach may be so situated and develop in such a manner that it does not cause symptoms early in the course of its growth. When the growth arises in the cardia or fundus, recognizable symptoms may be produced only after extension or metastasis has rendered the condition inoperable. There seems to be little or nothing that can be done to overcome this obstacle to early diagnosis. The second factor which may lead to late diagnosis resides largely with the patient because of his failure to seek medical attention promptly following the onset of symptoms. The mild and apparently innocuous nature of the symptoms may mask the seriousness of the underlying lesion. Another cause of growing importance is the use of various home remedies and, more particularly, self-treatment as directed by the producers of certain patent remedies. As regards this "patient" factor which leads to late diagnosis of carcinoma of the stomach in a certain percentage of cases, something can, of course, be accomplished by intensified educational programs for the laity.

The third factor which leads to late diagnosis of carcinoma of the stomach in some cases resides with the medical profession in failure to recognize the condition early when the opportunity for diagnosis is presented. What leads to this failure on our part? There are, of course, numerous reasons. Unfamiliarity with the clinical picture which is presented by many patients having early carcinoma of the stomach may be responsible in some cases. Reluctance to secure roentgenologic examination because of expense or local unavailability of adequate roentgenologic facilities not infrequently results in a postponed diagnosis. If diagnosis is to be made while the lesion is still curable roentgenologic examination must be carried out, in many cases, when perhaps the lesion is suspected only faintly and not after the clinical diagnosis is obvious.

In addition, there are certain pitfalls in the diagnosis of carcinoma of the stomach against which we should be on guard. First and foremost probably is that of gastric ulcer. Whether a benign gastric ulcer may become malignant will not be discussed at this time; however, the fact remains that certain patients who actually have a small ulcerating carcinoma of the stomach may be thought to have a simple benign gastric ulcer.

Our responsibility, therefore, after establishing the diagnosis of gastric ulcer if operation is not performed at this time includes careful observation, both clinical and roentgenologic, in order to be certain that the ulcer disappears entirely, as anything short of this is not evidence that the lesion is benign. Furthermore, the patient should be followed over a period of time in order to be certain that recurrence does not take place. In certain cases a diagnosis simply of anemia may be made and the underlying cause of the anemia such as carcinoma of the stomach or a malignant lesion elsewhere in the gastro-intestinal tract may remain undetected. For this reason roentgenologic examination of the stomach and in fact the entire gastro-intestinal tract should be performed in every case of severe anemia of indeterminate cause. At times a gastric polyp may be or become malignant, and when a polyp is found in the course of roentgenologic examination of the stomach it should not be disregarded merely because it does not appear to be responsible for the patient's symptoms. In most cases such polyps probably should be removed, but if such a polyp is not removed surgically it should be observed by a competent roentgenologist periodically in the future and operation performed if there is any growth or other change in its physical characteristics. The fourth group of patients in whom carcinoma of the stomach may not be recognized early is represented by the individual of middle-age or beyond who comes to the physician with obvious organic disease, the exact nature of which cannot be determined. The patient usually is anemic, has lost weight and is weak; yet, all methods of clinical investigation including roentgenologic and perhaps even gastroscopic examination reveal only normal findings. We should insist that this individual return for reëxamination in two or three months, as at that time a growth in the stomach may be detected. If the patient is left to his own devices and not impressed with the importance of reëxamination in the near future, he may return six or twelve months later with a carcinoma of the stomach which is grossly inoperable.

What are the prospects of cure for the patient who has carcinoma of the stomach? When these prospects are considered from the point of view of all cases in which the diagnosis has been made, the outlook is rather gloomy; however, when one considers the prognosis of those who have had the benefit of gastric resection, the chance of cure is far more favorable. Considering first all cases in which the diagnosis is made, experience at the present time at the Mayo Clinic reveals that surgical exploration is performed in approximately sixty of each 100 cases, and in the remaining forty, palliative medical treatment alone is instituted because of the advanced and obviously inoperable nature of the lesion. Of these sixty cases in which exploration is performed, resection of the stomach is performed in approximately thirty. Postoperative mortality will account for approximately five of these thirty patients. This means, in other words, that in only approximately twenty-five of the original 100 cases in which the diagnosis was made will the patients have a chance for cure and only about one-third of these will live for five years. Obviously, if diagnosis were established earlier in a higher percentage of cases, surgical removal of the lesion could be accomplished more frequently and consequently the number of cures increased.

If we consider the prospects of cure only from the point of view of those who have undergone gastric resection and survived the operation, the outlook is more favorable. In a recent study of 10,890 cases in which gastric carcinoma was diagnosed at the Clinic in the years 1907 to 1938, inclusive, it was found that of the 1,951 patients who survived gastric resection and were traced, 29 per cent lived for five years or longer following operation. There are, of course, many factors which influence the prognosis when gastric resection has been performed. The three most important factors are: (1) grade of the lesion, (2) local extent of the lesion, and (3) the presence or absence of involvement of the regional lymph nodes.

Summary

It should be emphasized that carcinoma of the stomach occurs very frequently, probably more frequently than we are inclined to realize. At present the only hope for cure of carcinoma of the stomach resides in surgical removal of the growth. The only hope of removing a carcinoma of the stomach surgically resides in establishment of the diagnosis sufficiently early. The means for establishing the diagnosis of carcinoma of the stomach early are within reach of us all,

namely: appreciation of the early symptom-complex of this lesion, a carefully elicited history, an easily aroused suspicion of gastric carcinoma, and the insistence on roentgenologic examination by a competent specialist in this field in any case in which the presence of a malignant lesion is faintly suspected. Of patients who survived gastric resection, 29 per cent were alive five years after operation.

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PROGNOSIS FOLLOWING PALLIATIVE RESECTION FOR CARCINOMA OF THE SIGMOID*

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UNFORTUNATELY, as yet in the therapeutic attack on carcinoma of the colon, sufficient progress has not been made in either the medical education of the public or the diagnostic acuity of the physician. Accordingly, many patients suffering from such malignancies find that their condition is in an advanced stage when they are first subjected to operative procedures. It is inevitable that surgeons interested in patients who have colonic neoplasms frequently will find, on opening the abdomen, a carcinoma which is inoperable, so far as cure is concerned, either because of the local situation or because metastases are present in the liver. Such a situation is perplexing for the surgeon inasmuch as the prognosis is so hopeless. The local growth may be of the small annular variety, and nearly every surgeon can recall a case either in his own practice or in that of a colleague, in which resection of such a malignant lesion, even when metastasis is present, is followed by a considerable period of well-being on the part of the patient, during which time the patient actually may gain in weight and strength.

Because luminal obstruction of the intestine is or will be present if the patient has carcinoma of the colon, the surgeon must act in some manner to circumvent the discomforts attendant on such a catastrophe. Action must be taken even though a cure may not be achieved.

When the lesion is situated in the right half of the colon, ileotransverse colostomy will short-circuit the obstructed region and will solve the difficulty so far as obstruction is concerned. When the transverse, descending or sigmoid segments of the bowel are involved, the tumor-bearing portion often may be exteriorized and removed. Occasionally, in the splenic flexure and descending colon, when there is redundancy in the transverse and sigmoid portions of the colon, colocolostomy may be accomplished. Still more rarely, sigmoidosigmoidostomy, rather than resection, may be the procedure of choice. Colostomy, on the other hand, usually is the procedure of choice for inoperable rectosigmoid and rectal lesions.

Statistical studies pertaining to the duration of life of patients following palliative resection for carcinoma in any segment of the colon are not numerous. Gabriel and Lloyd-Davies, discussing the performance of colostomy for inoperable carcinoma of the rectum, presented an interesting analysis. Two hundred and thirty-eight patients having locally inoperable cancer were subjected to colostomy and more than 50 per cent died within twelve months after this operation. Metastases to the liver and peritoneum were present in a group of sixty-eight patients subjected to colostomy and, as might well be predicted, more than 50 per cent of the patients were dead within six months of the performance of this operation.

Colocolostomy may be done if the malignancy is situated in a favorable site. However, the procedure is not safe in the presence of more than a mild degree of obstruction. The advantage

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of avoiding creation of an abdominal anus is readily apparent in cases in which colocolostomy can be performed. Wilson and one of us (Mayo), previously have reported the results of palliative colocolostomy performed in forty-two cases of inoperable malignant tumors of the colon. Significant features of this review were the facts that the primary operative mortality was 14 per cent and that five of the six deaths occurred in cases in which the transverse colon was anastomosed to the sigmoid segment. Increased tension on the line of anastomosis and leakage may have accounted for these deaths; for this reason preliminary cecostomy may be called for in such circumstances. Among the thirty-six patients who survived the operation, the average duration of life was 11.5 months.

The advantages of simple colostomy done above the tumor-bearing portion of bowel are apparent. Intestinal obstruction is prevented or relieved, abdominal pain is alleviated and the danger of hemorrhage is lessened. In addition, patients who have rectal carcinoma report a decrease in discharge and mitigation of tenesmus, both of which results are particularly appreciated. Many individuals have a temporary abatement from the cachectic syndrome, frequently associated with inoperable carcinoma. Appetite, weight and strength are enhanced for a variable period, although the end result is forecast at the time of surgical therapy. However, a brief and often happy respite from their difficulties is afforded these unfortunate individuals.

In the treatment of patients who have small lesions which can be removed without technical difficulty, the primary growth often may be resected to the advantage of the patient. Although statistically unproved, it is the feeling of many surgeons that, even when demonstrable metastasis of small degree is present in the liver, the secondary lesions do not develop as rapidly when the stimulating influence of the preliminary tumor has been removed as they would were the primary lesion undisturbed. With these thoughts in mind, we studied a group of patients for whom palliative resections of various types for carcinoma of the sigmoid had been employed. These patients comprised an admirable group for study in that not only was the obstruction relieved by the operation, but in addition, the primary growth was removed. Some comparisons also may be made between members of this group and those patients subjected to colocolostomy referred to previously.

Fifty-five patients comprised the group for whom palliative resection for carcinoma of the sigmoid was performed. Included in this number were thirty-nine men and sixteen women, and as might well be expected, 82 per cent of the patients were between the ages of forty and seventy years. As further evidence of the risk of operation for these patients, it might be added that 38 per cent were in the sixth decade and 29 per cent were in the seventh decade of life. Only four of these people had malignant lesions which were considered to be locally inoperable in relation to eventual cure. The remainder of the group had nodules in the liver or peritoneal metastases.

By far the majority of these patients were subjected to the Paul-Mikulicz procedure of exteriorization of a portion of bowel or modification of this operation into extraperitoneal resection. In proceeding according to the latter technic, the growth is removed by cautery over a three-bladed clamp after the abdominal wall has been closed in layers. In some instances a catheter was slipped into the proximal loop of bowel to permit passage of gas and fecal material without contamination of the operative wound. Since the catheter remained in place for a period of five to eight days, sufficient progress in healing of the wound took place to prevent infection.

Ten of the fifty-five patients succumbed to the operative procedure, resulting in a primary surgical mortality of 18 per cent. An additional ten patients are still alive at the time of writing. The postoperative duration of life for the remaining thirty-five patients was 16.5 months. Because of the small number of patients, making of a correlation between the pathologic grade of the tumor and longevity did not seem justified. Of interest, however, is the fact that of the forty-four specimens subjected to pathologic grading on a basis of 1 to 4, thirty-one (70 per cent) were graded 2.

Although all of the patients subjected to colocolostomy did not have carcinomas of the sigmoid, nevertheless the lesions of members of the two groups are similar enough to point out a few comparisons, in spite of the fact that each group was small. It will be recalled that the average duration of life for thirty-six patients who survived colocolostomy in the first group

was 11.5 months and that the primary operative mortality was 14 per cent. In contrast, are the statistics derived from the present (second) group, in which there was an average survival of 16.5 months and a primary mortality of 18 per cent. It should be recalled that for some of the patients in the former group, colocolostomy may have been more feasible and expeditious than an exteriorization procedure.

It is freely recognized that the choice of therapeutic procedure for an inoperable carcinoma of the sigmoid is fraught with difficulty. The surgeon must consider the degree of risk involved, the probable expectancy of life for his patient and the degree of palliation expected from any particular operation. Primarily, intestinal obstruction must be relieved or averted. Therefore, three avenues of approach are open to the surgeon: performance of (1) colostomy above the situation of the lesion; (2) colocolostomy or a short-circuiting procedure about the neoplasm if the latter is favorably situated; and (3) exteriorization or extraperitoneal resection. If obstruction of any appreciable degree is present, an intra-abdominal procedure involving suturing of the partially devitalized bowel is hazardous and is contra-indicated. A vent for the fecal stream must be provided. This may be done in many cases almost as easily by exteriorization of the malignant lesion as by the creation of a double-barrel colonic stoma or cecal stoma. In addition, removal of the growth may have some part in increasing the expectancy of life of such patients. It must be emphasized that these considerations are but generalities and that for a particular patient the surgeon must think of the condition of that individual as a special problem. He should also remember that his estimate of risk is subject to error and that every possible advantage should be given these unfortunate people.

Summary and Conclusions

1. Prime observations concerning a group of fifty-five patients, for whom palliative resection of the sigmoid for inoperable carcinoma was performed, have been reviewed.

2. Comparison of these observations with those made concerning a group of individuals subjected to colocolostomy, reveals a slightly lower primary surgical mortality and a shorter duration of life postoperatively for members of the latter group.

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STARTING THE PRACTICE OF MEDICINE*

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UNDER this subject we shall discuss the following: choosing a location, problems of the young physician, his relation to his fellow practitioners and hospitals, regulation of fees, choosing between individual and group practice, and his responsibility for the future of the profession.

In this class, we shall assume that we have, in embryo, a representative of every branch of the profession.

To give each of you the proper advice for your future guidance in the various chosen pursuits is beyond anything I would attempt to do. What I am going to say to you today should apply to the average student who graduates from this or any medical school. In order to qualify for such advice, one's own medical experience must necessarily have been considerably varied.

If you will pardon me for a brief personal reference, I will just mention the various experiences I have had since leaving this University Hospital in 1911. First I spent five years practicing in a small town in the western part of this state; then five years at the Mayo Clinic, including one and a half years in the Great War. Since then I have practiced in Minneapolis, during which time I have always been connected in a comparatively small way with teaching in this medical school.

For my own satisfaction, it has given me a chance to come in contact with not only widely different types of practice, but perhaps more

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widely different types of men. It is always interesting to observe the various attitudes of men, in general practice, in highly specialized group practice, and the full time research and teaching positions, toward the real practice of medicine.

The first question each student asks himself when contemplating the beginning of practice, is: Where shall I locate? This, I think, properly should be the first question. Fortunately not all are suited for the same kind of practice. A small percentage of you will be attracted to laboratory work, research or teaching positions. It has been estimated that about 10 per cent of each class take up this sort of medical work. All of you will want further school work. If you have the inclination and are financially situated to do so, I advise you to go on now. If your course is interrupted, you may never get back to study and reach your goal. If this is likely to happen, I believe you should continue your school work now. However, I would like to see every physician, no matter what his future career, put in some time in the general practice of medicine.

As stated before, as we come in contact with the men in various fields of medical work, it is interesting to note the various attitudes of these men. They seem to vary according to the type of work chosen.

To care for the sick is the ultimate aim of every man who enters the medical profession. Even a short time in the general practice of medicine fosters understanding and a coöperation at a later date on the part of the specialist.

Many of you will be anxious to get started in the real practice of medicine. Self-preservation is the first law of life. After this long financial drain, you will feel that you must get out where you can begin to get some financial return on your investment.

After living here for some time in the glare of the city lights, many of you will hesitate to take up a rural practice. The recent depression, poor crops, low prices, and other numerous obstacles have made rural practice appear less attractive. Neither is it so convenient to attend medical meetings, call in consultation, and make free use of laboratory aids. In spite of all these obstacles, many of you will practice in rural districts and be successful.

Some of you with little or no experience in living in the country may have difficulty adjusting yourselves to the situation, for, in order to be successful, you must became a part of the community in which you locate. Many of you will be able to adjust yourselves to any situation you happen to face.

At present there is much agitation about the dearth of rural physicians. This need is much exaggerated. Our survey of this state does not show any great shortage of rural physicians. There are some isolated, sparsely populated areas in the northern part of the state in which physicians are widely separated. The few people who reside in these areas must expect to travel some distance for medical care. Even with government subsidy it would not be feasible to establish first class medical care close to these people. Our investigation has shown that it is not so much lack of medical care in these districts as it is indifference or lack of education on the part of certain groups. Physicians within reach have never refused to go many miles to see these patients or give them adequate care, even with no prospects of financial return. The State Medical Association not long ago requested through the newspapers throughout the state information regarding those who had been unable to obtain adequate medical care. About 200 replies were received. These replies showed definitely that these people could not be satisfied or that they did not know how to avail themselves of the medical care provided for them.

Granted that there is no scarcity of medical men in this state, the normal retirement and loss by mortality will make room for those of you who wish to take up general practice in the rural districts.

Nothing will cause you more apprehension when you contemplate starting out to practice than that you may have to sit in an empty office waiting for patients. To avoid this, many start out on small salaries. This is all right provided you are building for the future. If you have opportunity thereby to come in contact with good material and to obtain valuable experience, you will have made a wise choice. You will at least keep busy and have a chance to show what you can do. If you do your work well, not only the physician with whom you work but also the patients will soon recognize your ability. Soon you will establish yourself as a practitioner of medicine. Whatever presents itself from then on, you should be ready to cope with.

If you accept a small salary from some county,

state or federal agency, in which there is little chance for advancement, then I think you will make a mistake. Occasionally a physician accepts a small salary from some of these agencies to take care of a practice which justly belongs to the local physician. County Boards have done this in the past. Today the Minnesota state law gives the indigent patient the right to choose his own physician.

In he large cities the indigent patient is still taken care of largely without remuneration to the physician, but in the rural districts this is not the case. An agreement with the various boards responsible for the indigent, allows the physician a fixed, reduced fee for the care of these patients in rural areas.

While there will be disadvantages, mentioned before, in the ordinary rural practice, you will have many advantages that the city practitioner never experiences. Here you are thrown on your own responsibility. You must make decisions by yourself. You must develop initiative. You will have to make your diagnosis frequently without having laboratory men or consultants to make them for you. This work will frequently develop your judgment to a surprising degree. I have in mind a man with whom I came in contact when I first started to practice in the country. Although he was a comparatively young man, he had practiced several years. When he received his medical education not even a high school education was required for entrance to the medical school. Then there were medical schools giving courses of two or three years. A medical degree was not required to practice medicine. If one could get by the State Board examinations, he could practice medicine. This man had such a limited scientific education. But he really had learned the "art" of the practice of medicine. He was untiring in his efforts to please the patient. He had acquired all the qualities necessary to attract and hold his patients. He was always neat, clean, sympathetic, mildly humorous, and tolerant to the highest degree. He did everything possible to give the patient relief, even if it was only temporary. Then he got down his books and worked and studied that he might give the patient the best he could.

While he started out a very young man with a very limited scientific education, he eventually became one of the highest types of the old time family physician. Rarely did his patients go elsewhere without consulting him. After fifteen or more years in country practice, he took up special work and now is a successful specialist.

The recent rapid development of county medical societies and the continuation courses here at the University of Minnesota give the rural physician a good opportunity to keep up with the rapid development of medical science. No state gives the rural physician better opportunities to keep abreast of medical progress.

Some of you will become rural physicians. These small communities will need you. Some of you will be contented to remain there, and will become not only successful physicians but the most influential citizens in the community. Some of you may desire to get away later. Even if you do, I am sure you will consider such practice a valuable experience in your life. Many of our most successful specialists in the city now, began as rural physicians.

If you begin general practice in the city, after your year of hospital internship, you will encounter many of the same obstacles that your contemporaries will in the rural districts. Competition will be more keen. More often your patients will go to another physician without even hinting to you that they are going. You must learn to expect this and not take too great offense from it. Perhaps the patient has shown good judgment. You must cheer up. Try to forget the loss of this patient and learn by the loss of this one how to hold the next. If you feel that the patient is not satisfied or that you are not succeeding with the patient, it is often wise for you to be the first to suggest consultation.

Our profession must uphold the right of free choice of physician for every patient. If a patient is examined by you and is not satisfied with your opinion, he has the right to consult any other physician he may desire.

Again, in starting general practice in the city, it is usually advisable to work with an older man who has a well-established practice, if that is feasible. First, be sure that the older man holds the respect of the profession and the community. You may be tempted to practice with a man who has a very large practice but who has obtained this practice by unfair or unethical means. He may not retain this practice for long if his principles are unsound. A man with little experience may have difficulty in judging an older man's standing.

You have learned quite well the scientific side of the practice of medicine. With the older established man you will not only add to your knowledge of scientific medicine but you will learn something of the art of the practice of medicine. A noted medical man has said that the latter is of about equal importance with the former so far as your success in the practice of medicine is concerned.

Many fanciful and bizarre plans for the practice of medicine are being put before the young man of today. Beware. Do not enter into any unusual plan until you have studied it carefully. A plan that may be attractive to you today may serve to mar your future. Your county and state medical society, as well as some of your older confreres, stand ready to advise you in all these matters.

Peace and harmony is important in all walks of life. Perhaps in no walk of life is it more important than in the practice of medicine. Always strive to coöperate with your medical confreres. You may think, as some already have, that you are going to establish prestige by criticising your competitors. Do not do it. Some day you may need their assistance. Whatever mistakes they have made, you may make sooner or later. The longer one practices, the more he realizes the value of the friendship of his fellow physician. A noted physician once said: "Never throw mud at the other fellow. If he throws mud at you, strive to get so far ahead of him that he cannot reach you." Jealousy or the lack of skill on the part of the offender, is frequently evident in these cases.

Sir William Jenner said: "Never believe what a patient tells you the other doctor said." Remember, patients will misinterpret what you say as well as what the other doctor said. Complaints coming to our medical societies bear out the truth of the above quotation. Many malpractice suits have their beginning in unfortunate remarks of a physician made relative to the work of his competitor. It behooves us all to be especially cautious in our comments on the work of the other fellow.

No physician can carry on a large successful practice without being intimately associated with a well-standardized hospital. If you practice in a rural area, you may have to conduct your own hospital or be closely allied with the management thereof. I would like to see every practicing physician put in a position where he would have to become acquainted with the trials and tribulations of hospital management. The average physician little realizes how often unfair patients and lawyers take advantage of unavoidable accidents in the hospital. An accident may be entirely the fault of the patient, yet frequently exorbitant damages are recovered from the hospital. Unfortunately, a careless remark by a physician may be the spark that starts the conflagration. Every first class hospital should have the undivided support of the attending medical staff.

The same Code of Ethics applies wherever you locate. Read this Code carefully. Some day you will be pleased that you have subscribed to this Code. There is no greater satisfaction in the world than to have followed a noble profession, lived up to all the rules and regulations, and held the respect of your profession and community. The value of such a career cannot be measured in silver or gold.

You here today have been sifted out of many more who started out with you several years ago. You are the sole survivors in the process of elimination. Wherever you go or whatever you do, be determined to be successful. Your success will not be measured merely by your financial gain, but more by what you have given to your profession and your community. Determination and a will to succeed are in your make-up or you would not have come this far. Having come this far, you must keep before you the rest of your lives the ideals of your profession.

Your teaching in school has dealth largely with the care of the patient with organic disease. In practice, you will be surprised to see so many sick patients in whom you can find no evidence of organic disease, yet must be treated by you.

The therapeutics of functional diseases, psychoneuroses, or, according to Crile, pathologic physiology may be your greatest problem. Because you do not find organic disease does not necessarily mean there is none present. Neglect or improper treatment of these patients by physicians of the past has had much to do with the presence of cults in our midst today. Never tell a patient there is nothing wrong with him or to go home and forget about his ailment. There is something wrong or he would not have come to you. Try to discover his trouble and remedy it if possible. Study these patients carefully. If you are not satisfied that you can help them,

call in consultation. Try to relieve their suffering, even if only temporarily. Then study some more. Do not overlook any detail. Do not give them up to the cults. You will be the defenders of the profession in the future. You cannot legislate the cults out of existence. Their personalities and salesmanship are ready substitutes for appropriate medical care. Your foundation, your training and standing render you the most capable persons for the care of the sick, whether or not their illness has a pathological basis.

The success of the chiropractors and other cults is well inferred by a remark of the late Dr. Charles Mayo. He said, "Rub a dog's back and he's your friend." The cults have won the friendship and confidence of these unfortunate people who need sympathy and friendship, by rendering them just such service. With the help of your confreres, you can and should be able to hold these patients.

While I do not believe we should spend our time and efforts talking about or condemning the cults, I do not agree with the medical man who believes we should sit back and let the cults thrive by exerting undue influence on our legislators or state officials. I am convinced that if the medical men of the past had put forth sufficient effort, few of these cults would have been licensed to practice their pseudo-magic on deluded people. You will be the only properly trained group to see that healers outside your profession do not gain footholds in the future. Do not let politicians or other outside groups control the practice of medicine. Outside control means chaos and inferior medicine.

The State of Minnesota is today notable for the coöperation which exists between the legislators and state officials and the medical profession. Minnesota is one of only thirteen states in this country that has been successful in enacting a Basic Science Law. When you learn that not more than a dozen healers outside your own profession have been able to pass the Basic Science examinations during the past twelve years, you may realize something of the importance of this law.

To preserve these accomplishments in your state requires constant vigilance. The responsibility for maintaining this vigilance will be yours. Do not shirk it. No matter how busy you are, take time to study the economic side of practice and learn the inroads outsiders are trying to make on your profession.

Socialized or government controlled medicine has recently been a subject of much discussion. Study this subject for yourself. You will be surprised to learn how many apparently intelligent people have been deluded sufficiently to make them advocate this system of practicing medicine. You will find on investigation that the agitation for such a sysem is fostered largely by political racketeers, social workers, commercial magazine writers, or medical men who know little about the real practice of medicine. Usually you will find there is some selfish interest at the bottom of any promotion in this direction. It always means the control of the practice of medicine by the politicians.

No greater opportunity for graft could be offered for politicians than the control of our profession. In Germany, under government control, 40 per cent of all money paid in for medical care is used in administration. Some recent bills introduced into Congress, if they become law, would do much to put us under federal control. It is you who must not only care for the sick but also must control that care.

In the matter of fees for your work, you will usually have little trouble. Fees for medical work vary in different communities. After much discussion between medical representatives and lay groups, a fairly uniform fee schedule for the indigent has been established in this state. This you will always obtain from local authorities in rural communities. In Hennepin County a minimum fee schedule has been adopted for the average patient. This was mainly a defense measure. Many compensation insurance companies have exerted influence to cut medical fees to an unreasonable degree. In areas where the overhead expense is less, the fees are naturally less.

Some of you will be asked to join medical groups for the practice of medicine. There are quite a number of successful groups carrying on today. Not many medical men are leaders. It takes real leaders to successfully head medical groups. Medical men are naturally individualists. The extensive training of the medical man fits him for independent thinking. It is usually difficult for him to subjugate his ideas to those of a leader. In a successful group, the ideas of all usually must conform to those of the leader. A chain is only as strong as its weakest link. A

medical group built with every department up to standard, with unity of purpose throughout, should give the greatest efficiency in the practice of medicine. This does exist in some medical groups. If you are fortunate enough to join such a group, you will make no mistake. Such opportunities, however, are rare.

No matter what kind of practice you enter, no matter what branch of medicine you specialize in, your success will be determined by the degree in which you measure up to several determining factors. First among these factors we must place your scientific attainment. You must keep abreast with medical times. You must attend medical meeings, and read good medical literature. Do not fall into the habit of letting the drug houses furnish you your only medical literature.

A notebook in which to keep notes of unusual symptoms and unusual cases, as well as important excerpts from medical literature, is often a valuable aid. From this you may gain knowledge readily when you most need it.

Important as is your scientific knowledge, it only slightly outweighs the importance of your knowledge of the art of the practice of medicine. In this, your ability to know human nature and efforts to please the patient from every point of view are the important elements.

Your appearance, your sympathy for the patient in his suffering, and a tolerant attitude to all his whims, help you to hold the confidence of the patient until you have an opportunity to make a diagnosis of his trouble and determine what you may be able to do for him.

Never forget the wise saying of Epictetus: "Know ye that education and skill are a continuous progression and he that addeth not to that he hath, soon loses his store thereof."

In the time allotted you have received the best training for caring for the sick that is humanly possible. Do not miss an opportunity to add to this store of knowledge. Remember there is always room at the top, but do not miss any steps on the way up.

Be true to yourselves, your patients, and your profession, and some day you will be proud of your profession and your profession will be proud of you.

THE PRESENT SURGICAL MANAGEMENT OF ESOPHAGEAL DIVERTICULA WITH PRESENTATION OF A NEW (?) METHOD*

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THE surgical management of pulsion diverticula is a distinctly controversial subject. All writers agree that when feasible the sac should be removed, and that it may be removed safely in two stages, but much argument arises as to the safety or danger of the one-stage operation. The writer believes that he has a technical procedure not found described in a review of the medical literature which possesses all the advantages of the two-stage operation but which may be entirely accomplished in one stage.

The history, etiology and origin of pulsion diverticula were presented by Cottam,[4] a member of this society. Pharyngeal or pulsion is probably more correct than esophageal diverticula but the latter is still a freely used term, and because of popular usage is so classified by the *Year Book of Surgery*.

The force applied by the constrictor muscles of the pharynx causes a herniation of mucosa and submucosa through a constant area of weakness of the posterior pharynx in the presence of stricture, or a synchronous spasm of the muscles at the entrance to the esophagus. Fibers of muscle follow the herniated sac to a greater or lesser degree and can be adequately separated and used to reinforce the defect after removal of the herniated sac. This has been demonstrated by Kirschner[8] annd used effectively by us. An ingenious contrivance has been devised by Jackson to demonstrate the mechanics of the herniation. The weakened area posteriorly has been described by Killian,[7] Lord Moynihan and others.

Anatomically the fascial planes of the neck continue downward into the chest in such a manner that the interfascial spaces are continuous with those of the mediastinum. Spreading infec-

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tions involving these spaces of the neck rapidly produce a mediastinitis which is usually severe if not fatal. Rea,[11] working with Wangensteen in the study of the gases of obstruction, found that mediastinitis followed one-stage esophagostomy and transverse sections of the esophagus in dogs. Hofer[6] reports one case of mediastinitis with death in fourteen operations for diverticula. Certainly many unreported similar experiences must be the basis for its wholesome regard in esophageal surgery.

Babcock,[1] in his *Surgery,* states, "To prevent mediastinal infection the operation should be done in two stages." However, in 1937 he (Babcock)[2] states that they have performed sixty-five one-stage operations and that he has seen no mediastinitis. Shallow[12] likewise advocated the one-stage procedure, while Harrington[5] advocated the one-stage operation in selected cases, namely small diverticula with a fairly definite neck. His figures, however, showed four two-stage operations to each one-stage operation.

Lahey[10] insists on adhering to the two-stage operation because of its security, based on low mortality, freedom from cellulitis of the neck, mediastinitis and the absence of complications.

The principles of surgical management have been based upon, first, removal of the sac, second, avoidance of infection with concomitant mediastinitis and, third, prevention of recurrence.

The method advocated by Goldman,[9] in which the neck of the sac is ligated with silk thread, the lower end of the incision packed with gauze and the silk thread and diverticulum allowed to slough off, incorporates the principles of the operation which we describe. The sac is not opened, the surfaces of the incision are not contaminated and, therefore, the element of infection is eliminated. Koenig recommends dissection of the sac and its attachment in an upward direction so that it drains rather than fills during the act of swallowing. In this instance, the sac is not removed and as a result, again contamination is eliminated.

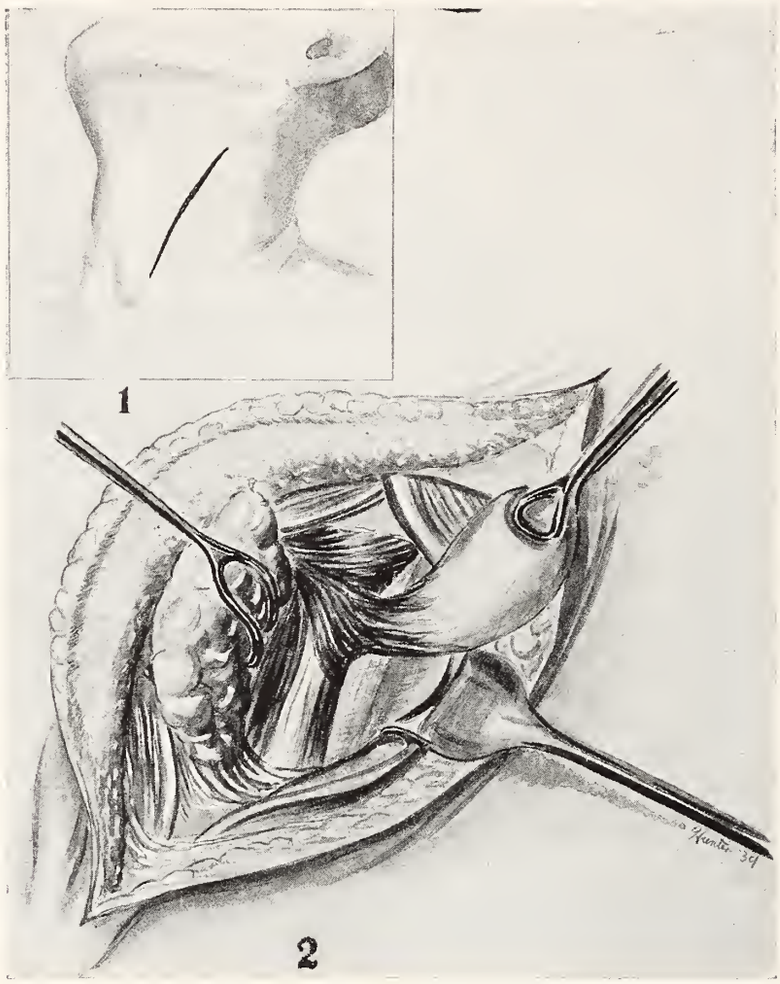


Fig. 1. Incision at the anterior border of the sternochleidomastoid muscle to approach the diverticulum.

Fig. 2. Thyroid retracted medially, great vessels laterally; esophagus and diverticulum freed.

Inversion of the sac into the esophagus has been recommended either through the use of purse strings or by intra-esophageal and extra-esophageal manipulation. With a small neck and some edema of the sac, inversion may be impossible. In one instance reported in which the inverted diverticulum became edematous and by its enormous increase in size threatened death to the patient, emergency removal of the swollen and partially gangrenous sac through the esophagoscope was necessary.

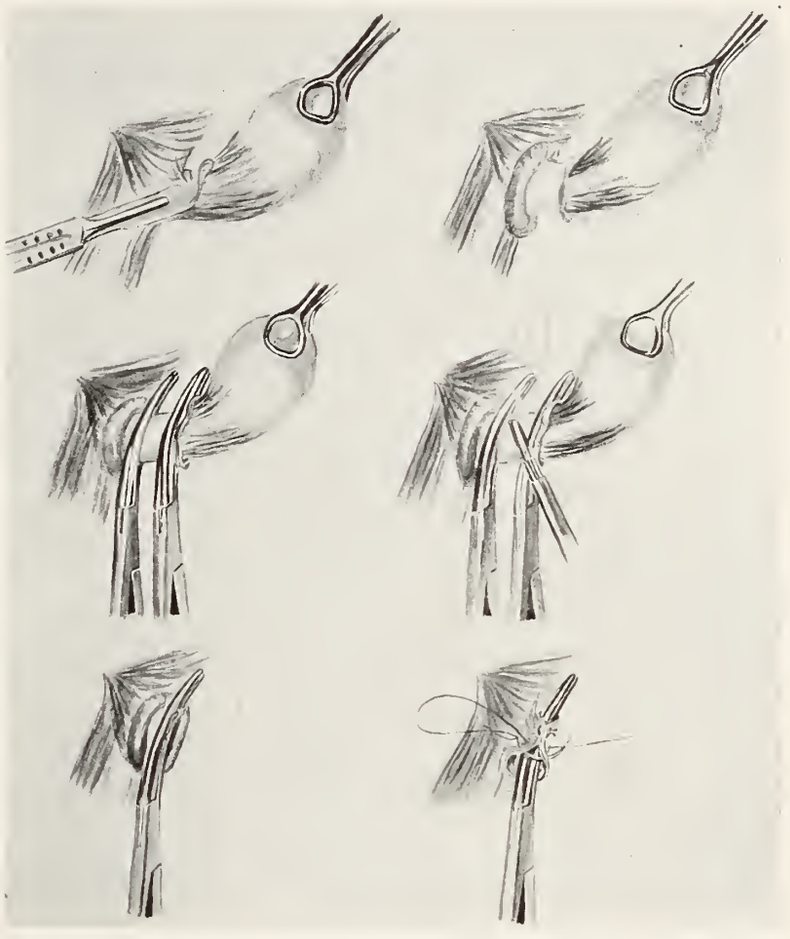


Fig. 3. Six illustrations in which the muscle and fascia surrounding the neck of the diverticulum are divided and separated back to form a cuff. The mucosa and submucosa are doubly clamped and the pedicle divided close to the proximal forceps by actual cautery. The muscle and fascia are sutured over the forceps, which is allowed to remain *in situ*.

The present-day trend of surgical management consists of removal of the sac in one or two stages. Babcock[3] and those associated with Jackson have advocated the one-stage resection, the sac being identified and its dissection facilitated by the use of the esophagoscope. The light may be introduced into the diverticulum if the opening is adequate and the limits of the sac visualized by its red glow. By very careful technic the sac is removed, the mucosa and submucosa carefully inverted and the rent reinforced by approximation of the muscle fibers. The patency of the esophagus is assured by suture of its wall over the esophagoscope. The chief objection to this procedure is that the neck of the diverticulum must be opened. Therefore, the wound is compounded and repeated instances of cellulitis of the neck are reported.

The two-stage operation advocated by C. H. Mayo, Lahey and subscribed to by numerous others has the distinct advantage that the sac is liberated and anchored in an upward direction in the neck but not removed. The wound, therefore, is not contaminated. The lower portion of the incision is packed with gauze which is allowed to remain until the mediastinum is entirely separated by adhesions and granulations. After an interval of ten or twelve days the sac may now be removed with safety because contamination of the wound is not followed by a spreading cellulitis. The two-stage procedure possesses two distinct advantages: (1) the elimination of infection, and, (2) improvement in

the patient's nutrition when the large overfilled diverticulum which has caused interference with the patient's swallowing is transplanted to an upward position. Such technicalities as careful preservation of the recurrent laryngeal nerves which lie in the tracheo-esophageal angle and prevention of narrowing of the esophagus should always be observed. Lahey has warned against undue division and ligation of large thyroid vessels, as occasional instances of fatal secondary hemorrhages have occurred.

We have chosen to present for your consideration a technical procedure which we believe possesses all of the merits of the two-stage operation, most important of which is elimination of wound contamination and infection but which may be accomplished by a single operation.

Case Report

A white man, aged forty-eight, came for treatment with the complaint that he has had increasing inability to swallow for about two years. He stated that he had had a gurgling in his throat which came on after eating. The condition had been growing progressively worse. At present besides the difficulty in swallowing he had to spit up a considerable quantity of food after eating. His impression was that solid foods passed more readily into the stomach than did liquids. There was no pain before, during, or after eating. His family history, personal history and past illnesses are essentially unimportant.

Examination revealed a well developed, well nourished male with a completely normal physical examination. X-ray examinaton with an opaque medium showed a pouch which filled completely and which measured 7.4 centimeters vertically by 4 centimeters laterally. After the pouch was completely filled the remaining portion of the food entered the esophagus normally.

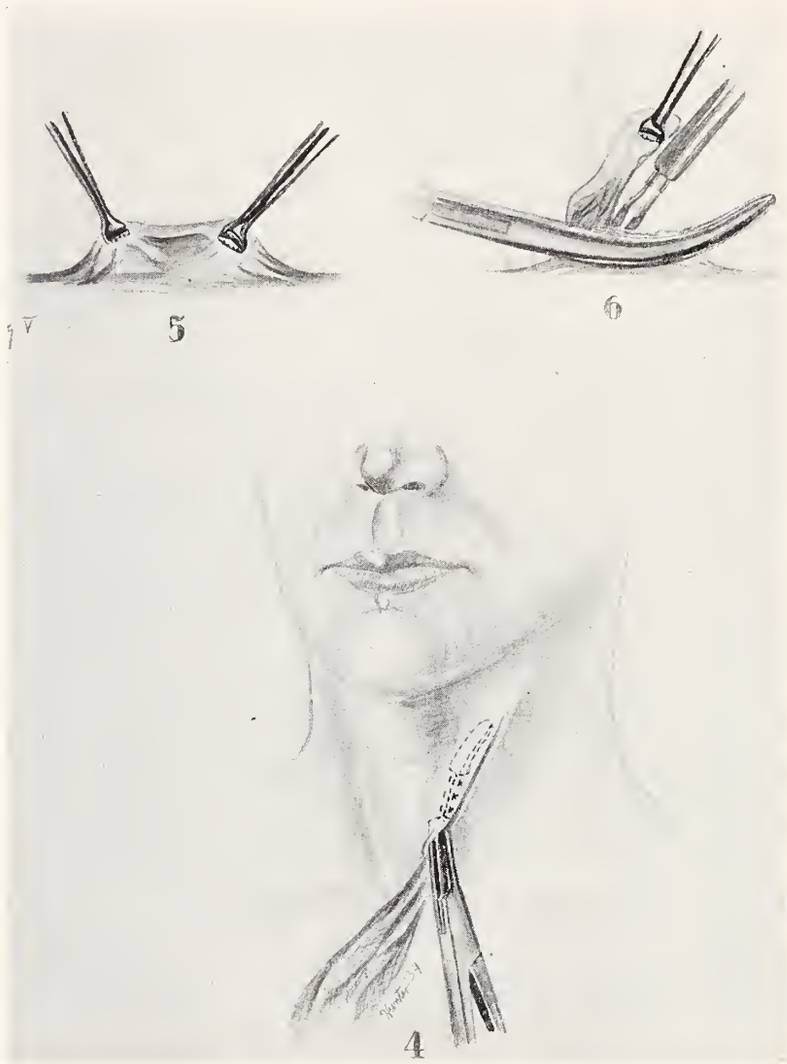


Fig. 4. A small gauze pack over the mediastinum escapes over the lower angle of the incision together with the forceps, which has been left across the stump of the diverticulum. The wound is closed throughout the rest of the incision.

Fig. 5. The lateral wall of the esophagus of a dog is lifted by two Allis forceps to make a tent.

Fig. 6. The overhanging tent-like portion of the esophagus is cut away by actual cautery, which was examined to be certain that it contained mucosa and thus be assured that we had opened into the esophagus. The forceps is allowed to slough off.

Diagnosis.—Diverticulum of the esophagus.

Technic of operation.—A standard incision was made along the sternomastoid muscle, the thyroid was retracted medially and the great vesels laterally. The sac was identified and found to lie behind and to the left of the esophagus, extending downward into the superior mediastinum. It was dissected free to the attachment of its neck into the pharynx. The entrance to the mediastinum was carefully walled off with gauze and the muscle and fascial fibers which covered the proximal portion of the neck were separated by sharp and blunt dissection so that there was a definite cuff surrounding the stump. Two pairs of curved forceps were then applied to the neck and the sac divided close to the proximal forceps by actual cautery. This efficiently removed the sac, together with the distal forceps without any contamination.

It occurred to us that we have never hesitated to leave a forceps on the vessels in a difficult vaginal hysterectomy or in nephrectomies where ligation of a short pedicle or the condition of the patient seemed to indicate. As a result, the cuff, which had been carefully pushed back and preserved, was sutured over the forceps. The gauze packing was removed and the forceps only escaped through the lower angle of the incision. The forceps fell off on the sixth day and there was a persistent serous drainage for approximately one week. The wound healed completely by the end of three weeks and the patient made a normal, uneventful convalescence.

We have had only one opportunity to employ this procedure and we attempted to substantiate our experience by similar operations on laboratory animals in the Department of Experimental Surgery at the University of Minnesota.

The side of the wall of the esophagus of a dog was exposed and elevated like a tent by two Allis traction forceps. A curved forceps was then applied, the base and the points protruding beyond the esophageal wall similar to the technic recommended for the Kerr-Parker aseptic intestinal anastomosis. The protruding segment was removed by electrocautery and the removed portion carefully examined to be sure that it contained mucosa and thus determine definitely that the lumen of the esophagus had been entered. A gauze pack was placed over the superior mediastinum and the forceps allowed to escape with the gauze at the inferior angle of the incision. The forceps separated and fell off by itself at the end of five days. There was a small amount of watery drainage from the neck which persisted over a period of three days. The gauze was removed and healing was complete in eight days.

This procedure has subsequently been performed on three additional animals. In each one, the forceps separated spontaneously at the end of four to five days. There has been a watery fistula present for a period of three to eight days, but in no instance was there any cellulitis of the neck or mediastinitis. One of the animals has subsequently been sacrificed for other purposes and autopsy examination showed healing of the esophagus to be so complete that it was virtually impossible to determine the point from which the scallop of esophageal wall was removed.

The following graph shows the results obtained in four laboratory animals:

	Clamp Off, Days Postoperative	Fistula Dry, Days After Clamp Fell Off
Dog No. 1	5	3
Dog No. 2	5	7
Dog No. 3	5	8
Dog No. 4	4	4

Conclusions

Pulsion diverticula occur in people usually past middle life and may occur in individuals with concomitant heart disease, malnutrition, et cetera. As a result, we feel that a safe one-stage operation would have a decided advantage. We believe that the one-stage technic which we have presented possesses all of the elements of safety, particularly the elimination of mediastinitis.

Note—Subsequent to the presentation of this paper, Dr. Carl Rice and Dr. Clarence Arlander performed an operation by the same technic for diverticulum at St. Barnabas Hospital. The patient was extremely emaciated. The forceps fell off on the sixth day, the wound healed promptly and the patient made an uneventful recovery. She gained weight rapidly and has returned to normal health.

Dr. Owen Wangensteen, Chief of Surgery at the University Hospital, performed an operation at the University Hospital for diverticulum, likewise using the same technic as described in this paper. In this instance the forceps again fell off spontaneously, the wound healed in a few days and the patient made an uneventful recovery.

The series is now made up of three cases successfully operated by this method.

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POSTMORTEM FINDINGS IN CASES OF DIABETES*

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THE introduction of insulin not only has markedly reduced the number of deaths caused by diabetic coma, but it has made possible a dietary regimen which closely approximates normal physiologic requirements. Two results of such a revolutionary change in management may be expected. On the one hand, diabetic patients are allowed to live longer than they did before the discovery of insulin; therefore, more of them have degenerative complications of old age and other diseases common to the later decades of life. On the other hand, better nutrition and better control of their metabolic condition conceivably may oppose the development of complications to which such patients formerly were predisposed. While the literature already contains a valuable store of information concerning the pathologic changes associated with diabetes, the trends under new conditions can only be ascertained by the periodic appraisal of new material.

Material

The present study supplements the report of Wilder, which was based on the postmortem findings in eighty-one cases of diabetes. Most of these cases were observed in the pre-insulin era. Our report is based on: (1) a clinicopathologic study of 182 cases of diabetes which were observed in a period of about eleven years (October 1, 1925, to December 31, 1936, inclusive), (2) a microscopic study of the pancreas in 201 cases of diabetes, most of which are included in the 182 cases which have just been mentioned, and (3) a microscopic study of the pancreas in fifty consecutive cases in which patients who came to necropsy did not have diabetes. Necropsy was performed in 139 of 182 cases of diabetes in which clinicopathologic observations were made. Of the 201 cases of diabetes in which the pancreas was examined, twenty-five were observed in the pre-insulin era, that is, prior to 1923, and 176 were observed in the years 1923 to 1937, inclusive. The sections were stained with hematoxylin and eosin. In most cases two sections of the pancreas were available for study, one section of the head of the organ and one section of the tail. In the fifty cases in which the patients did not have diabetes the sections of the pancreas served as controls.

Clinicopathologic Data

In the 182 cases in which clinicopathologic observations were made, 106 of the patients were males and seventy-six were females. The ages of the patients ranged from one to eighty-nine years. In 91 per cent of the cases the patients were more than forty years of age and in 81 per cent of the cases the patients were more than fifty years of age. The average age of the patients at the time of death was 59.5 years, which is almost five years more than that reported by Wilder in 1926. During the period in which the 182 cases were observed, 5,478 new patients who had diabetes registered at The Mayo Clinic.

Events Which Constitute a Serious Threat in Cases of Diabetes

Diabetic Coma.—Table I summarizes the details regarding twenty-two cases in which the diabetes was uncontrolled at the time of death. It will be seen that coma was uncomplicated in only six cases and that in most of the six cases

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TABLE I. CASES IN WHICH PATIENTS WERE IN DIABETIC COMA AT THE TIME OF DEATH.

Case	Age, years	Sex	Associated pathologic changes	Comment
1	1	F		Moribund when treatment was started
2	7	M		Failed to respond to treatment
3	8	F		Diabetes resisitant to insulin
4	10	F		Failed to respond to treatment
5	10	F	Atrophy of suprarenal cortex	Failed to respond to treatment
6	28	M		Died elsewhere
7	30	M		Diabetes neglected; patient was a prisoner and was in coma many times
8	39	F	Hyperthyroidism	Died following thydroidectomy
9	43	F	Bronchopneumonia	
10	47	M	Exophthalmic goiter	Diabetes resistant to insulin
11	51	M	Diabetic gangrene	
12	52	F	Septicemia	
13	52	F	Vesicovaginal fistula	Fulminating onset of diabetes following operation
14	52	F	Cellulitis of arm	Refused hospitalization
15	55	F	Pyelonephritis	Moribund when first seen at the clinic
16	57	F	Gangrene	
17	67	M	Coronary occlusion	Diabetes resistant to insulin
18	67	F	Cellulitis of arm	
19	67	F	Coronary occlusion	Diabetes resistant to insulin
20	67	M	Hypertrophy of prostrate gland and uremia	Fulminating onset of diabetes following operation
21	68	M	Hypertrophy of prostrate gland and uremia	
22	71	F	Gangrene of leg; coronary occlusion.	

the patients were seen only after diabetic acidosis had been present for some time.

The incidence of coma in the 182 cases was 12.1 per cent. As should be expected, this was much lower than the incidence of 41 per cent in the series of cases reported by Wilder. As previously stated, most of the patients in Wilder's series of cases were observed in the pre-insulin era. Table I also shows the seriousness of such complications as acute infection and hyperthyroidism.

Overwhelming Infection.—In thirty-four, or 18.7 per cent of the 182 cases, an overwhelming infection was the primary cause of death. This figure does not include postoperative infections such as peritonitis, bronchopneumonia and infections of the blood stream, which are considered under the diseases for which surgical treatment was carried out. It does, however, include three cases in which gas bacillus infection of the stump followed amputation for diabetic gangrene. Erysipelas, bronchopneumonia, cellulitis and septicemia arising from superficial infections contributed mainly to the death of the patients in the thirty-four cases. The majority of the patients in these cases were well past middle age.

Tuberculosis.—For many years we have been struck by the infrequency of tuberculosis among

diabetic patients treated at the clinic. In only one case in this series was a positive diagnosis of active tuberculosis made, and in this case the diagnosis was made fortuitously. The patient had a carcinoma of the stomach that was associated with palpable cervical lymph nodes. One of these lymph nodes was removed for biopsy and was found to be tuberculous. In five additional cases the pathologist was able to demonstrate foci of active tuberculosis in what appeared to be healed pulmonary lesions. Similar lesions were reported in the hilar lymph nodes in four cases. In one case examination disclosed chronic tuberculosis of the pancreatic lymph nodes and in another case a tuberculous lesion was found in the liver. Some form of active tuberculosis, therefore, was encountered in twelve, or 8.6 per cent, of the 139 cases in which necropsy was performed, yet in none of these cases was tuberculosis the principal cause of death.

Degenerative Diseases.—Disease of the coronary vessels. Many authors have commented on the high incidence of degenerative vascular disease among patients who have diabetes. In 130 of the 182 cases the patients were more than forty years of age. The condition of the heart was noted at necropsy in all of these 130 cases. Coronary occlusion was the cause of death in fifteen, or 11.5 per cent, of the 130 cases. In these fifteen cases, nine of the patients were men and six were women. At the time of death the average age of the nine men was sixty years and that of the six women was sixty-five years.

Coronary sclerosis grade 3 or 4 also was present in fifty-three additional cases. In thirty-four of these cases the patients were men and in nineteen of the cases the patients were women. The mere presence of some sclerosis is an expected finding since it occurs among a high percentage of nondiabetic patients who are past the age of forty years. Including the fifteen cases in which death was due to coronary occlusion, coronary sclerosis grade 3 or 4 was present in sixty-eight, or 52.3 per cent, of the 130 cases. In these sixty-eight cases the diagnosis of severe coronary sclerosis was based on one or more of the following criteria: (1) recent or healed infarction of the myocardium, (2) fibrosis of the wall of the left ventricle, which is indicative of coronary insufficiency, (3) a history of angina pectoris, and (4) electrocardiographic findings, such as, for instance, bundle-branch block.

Willius, Smith and Sprague made a study of the incidence of coronary and aortic sclerosis in 5,060 consecutive postmortem examinations. They found coronary sclerosis grade 3 or 4 in 431, or 12.3 per cent, of the 3,513 cases in which the patients were more than forty years of age. Our series does not include a sufficient number of cases to warrant a comparison of the incidence of coronary sclerosis, according to the age of the patients, in the two series of cases, but there seems to be no doubt that the incidence of the severe forms of coronary sclerosis is significantly higher among diabetic patients than it is among patients who do not have diabetes. This has been borne out by the observations of Root, Bland, Gordon and White.

It is only fair, however, to say that in 870, or 17.2 per cent, of the cases reviewed by Willius, Smith and Sprague necropsy did not disclose any evidence of coronary disease. In 367, or 42.2 per cent, of the 870 cases the patients were in the first decade of life and in 795, or 91.4 per cent, of the 870 cases the patients were less than fifty years of age. Normal coronary vessels were not found in any of the cases in which the patients were in the eighth, ninth and tenth decades of life. The incidence of normal coronary vessels decreased as the age of the patients increased.

Diseases of the Peripheral Vessels.—A severe form of peripheral arteriosclerosis was present in fifty-one, or 28 per cent, of the 182 cases in which clinicopathologic observations were made. Gangrene or trophic ulcers occurred in thirty-one cases, and in twenty cases there was sclerosis of the vessels of the legs, which was of sufficient degree to cause clinical evidence of circulatory insufficiency. An analysis of the findings in the fifty-one cases furnished enlightening information. Since the changes in the two groups of cases differed only in degree, the cases will be considered as a single group.

Severe disease of the coronary arteries also was present in forty, or 78.4 per cent, of the fifty-one cases. Acute coronary occlusion was the primary cause of death in no less than fourteen, or 27.4 per cent, of the fifty-one cases.

In eighteen cases the patients died as a result of the gangrene. Details regarding the ocular fundi were available in thirty-six cases. In seven-

TABLE II. INCIDENCE OF SEVERE PERIPHERAL ARTERIOSCLEROSIS, ACCORDING TO AGE AND SEX, AMONG DIABETIC AND NONDIABETIC PATIENTS

Age, years	Diabetic patients		Nondiabetic patients		Diabetic men		Nondiabetic men		Diabetic women		Nondiabetic women	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
40 to 49	3	5.9	10	4.6	3	9.4	10	5.2				
50 to 59	14	27.5	51	23.3	11	34.4	48	24.9	3	15.7	3	11.5
60 to 69	20	39.2	96	43.8	9	28.1	83	43.0	11	57.9	13	50.0
70 to 79	13	25.5	49	22.4	9	28.1	41	21.2	4	21.1	8	30.8
80 to 89	1	1.9	13	5.9			11	5.7	1	5.3	2	7.7
Total	51		219		32		193		19		26	

teen, or 47.2 per cent, of the thirty-six cases examination of the ocular fundi disclosed either a central, punctate, diabetic retinitis or a mixed vascular and diabetic retinitis. Definite neurologic signs of peripheral neuritis were noted in nine of the fifty-one cases. The association of vascular disease, retinitis (especially a central punctate diabetic retinitis) and peripheral neuritis has been commented on by one of us (Dry[12]) in collaboration with Wagener and Wilder.

Whether or not there is an etiologic relationship between obesity and advanced arteriosclerosis is a difficult question to settle. The maximal weight was recorded in forty-two of the fifty-one cases. In twenty-six cases the patients had weighed more than 200 pounds (90.7 kg.) at some time.

It would seem that medium-sized muscular arteries, such as the coronary and tibial arteries, are particularly prone to undergo marked degenerative changes in cases of diabetes.[4] What we regard as of particular significance is the high incidence of severe arteriosclerosis among women who have diabetes. Table II shows the incidence of severe peripheral arteriosclerosis according to age and sex in fifty-one cases in which the patients had diabetes and in 219 cases in which the patients did not have diabetes. The 219 cases were included in the report of Hines.

This study and others reported in the literature suggest that something inherent in diabetes renders women particularly susceptible to degenerative changes in the vascular system. Such changes are especially likely to occur in cases in which the diabetes has been present for a long time. It is possible that an inherent defect or abiotrophy may exist in the vascular system and in the insulin-producing tissues and that when both structures are involved the physiologic process of aging may assume pathologic proportions.

Diseases of the Cerebral Vessels.—In nine of the 182 cases in which clinicopathologic observations were made death was due to a cerebral vascular accident, but permission to examine the brain was not obtained in a sufficient number of cases to provide information about the incidence of cerebral arteriosclerosis.

Associated Diseases That May Require Surgical Intervention

Cholecystic Disease.—In fifty, or 27.4 per cent, of the 182 cases gallstones were present or the patients had undergone an operation for cholelithiasis. In two of the fifty cases the patients also had acute cholecystitis. In another case, which is not included in the group of fifty, the patient had acute cholecystitis but did not have gallstones. The fifty-one cases in which there was a history or evidence of cholecystic disease may be divided into three groups. Group 1 includes fifteen cases in which the patients died following operation on the gall bladder or bile ducts.

Severe coronary disease was found at necropsy in three of these cases but it was not responsible for the death of the patients. Group 2 includes thirty-five cases in which gallstones were an incidental finding. In seven of these cases the patients died of acute coronary occlusion. In sixteen other cases the patients had severe coronary disease. The coronary arteries were relatively normal in the remaining twelve cases in this group. In the sixteen cases in which there was evidence of severe coronary disease, two of the patients died of a cerebral vascular accident and four patients died of gangrene of an extremity. Group 3 includes one case in which acute cholecystitis was associated with marked coronary sclerosis. Severe coronary sclerosis, therefore, occurred in twenty-seven of the fifty-one cases in which the patients had gallstones or acute cholecystitis. One would not for a moment claim a direct relationship between chronic cholecystic disease and arterial change even though both are in some way related to lipoid metabolism. The data show clearly, however, that in cases in which diabetes is associated with disease of the gall bladder the incidence of vascular disease also is high.

Malignant Disease.—Carcinoma was present in thirty-eight, or 20.9 per cent, of the 182 cases. The site of the carcinoma was as follows: pancreas in six, stomach in six, rectum or colon in ten, breast in six, genito-urinary tract in three, respiratory tract in three and in the liver and gall bladder in four cases, respectively. This incidence is much higher than that reported by other writers who have studied the postmortem findings in cases of diabetes. This may be attributable to the fact that a large percentage of patients who come to the clinic require surgical treatment, or it may be due to the fact that diabetic patients now live longer than they did formerly. In the eighty-one cases which formed the basis of Wilder's report, the incidence of carcinoma was so small that he failed to comment on it. A subsequent survey of his material disclosed one case of carcinoma of the pancreas.

Of particular interest is the relatively high incidence of carcinoma in recent reports of postmortem studies in cases of diabetes. As previously stated, carcinoma was found in thirty-eight of the 182 cases in which clinicopathologic observations were made. In six, or 15.8 per cent, of the thirty-eight cases the carcinoma involved the pancreas. According to McKittrick and Root carcinoma of the pancreas comprises only 4 per cent of all malignant tumors. Warren[13] reported that malignant lesions were found in forty-seven of 527 cases of diabetes in which necropsy was performed. In ten, or 21.2 per cent, of the forty-seven cases the malignant lesion originated in the pancreas. In four of the ten cases the development of the carcinoma antedated the development of the diabetes.

Pathologic Changes in Endocrine Glands Other Than the Pancreas

Thyroid Gland.—In twenty-seven, or 14.8 per cent, of the 182 cases in which a clinicopathologic study was made there was evidence of disease of the thyroid gland. Adenomatous goiter was present in twenty-four cases. In six of the twenty-four cases the adenomatous goiter was associated with hyperthyroidism and in two cases it was associated with acromegaly. A diagnosis of exophthalmic goiter was made in three cases. Thyroidectomy was performed in two of these cases. The postmortem report did not contain any special comment regarding the condition of the pancreas in these cases. Warren[15] did not find any especially characteristic lesion of the pancreas in cases of diabetes in which hyperthyroidism had been present for a long time.

Suprarenal Glands.—In one of our cases the patient, who was thirty-three years of age, died of classical Addison's disease. Necropsy disclosed marked atrophy of the suprarenal glands. In three other cases necropsy disclosed considerable atrophy of the suprarenal cortex. In the first of these cases the patient was a man, aged sixty-seven years, who died of coronary occlusion. Diabetic acidosis could not be controlled despite the administration of large doses of insulin. In the second case the patient was a man, aged twenty-nine years, who died after cholecystectomy. At the time of his death he apparently was in a state of shock; the value for the systolic blood pressure was 96 mm. of mercury and that for the diastolic pressure was 54 mm. In the third case the patient was a boy, aged ten years, who died in diabetic coma. Hyperplasia of the suprarenal cortex was noted in another case. The patient was a woman, aged seventy-one years,

who died of coronary occlusion and diabetic gangrene. In this case the acidosis could not be controlled.

portal vein. He had severe diabetes which had been discovered two years before his death. In both of these cases necropsy disclosed advanced

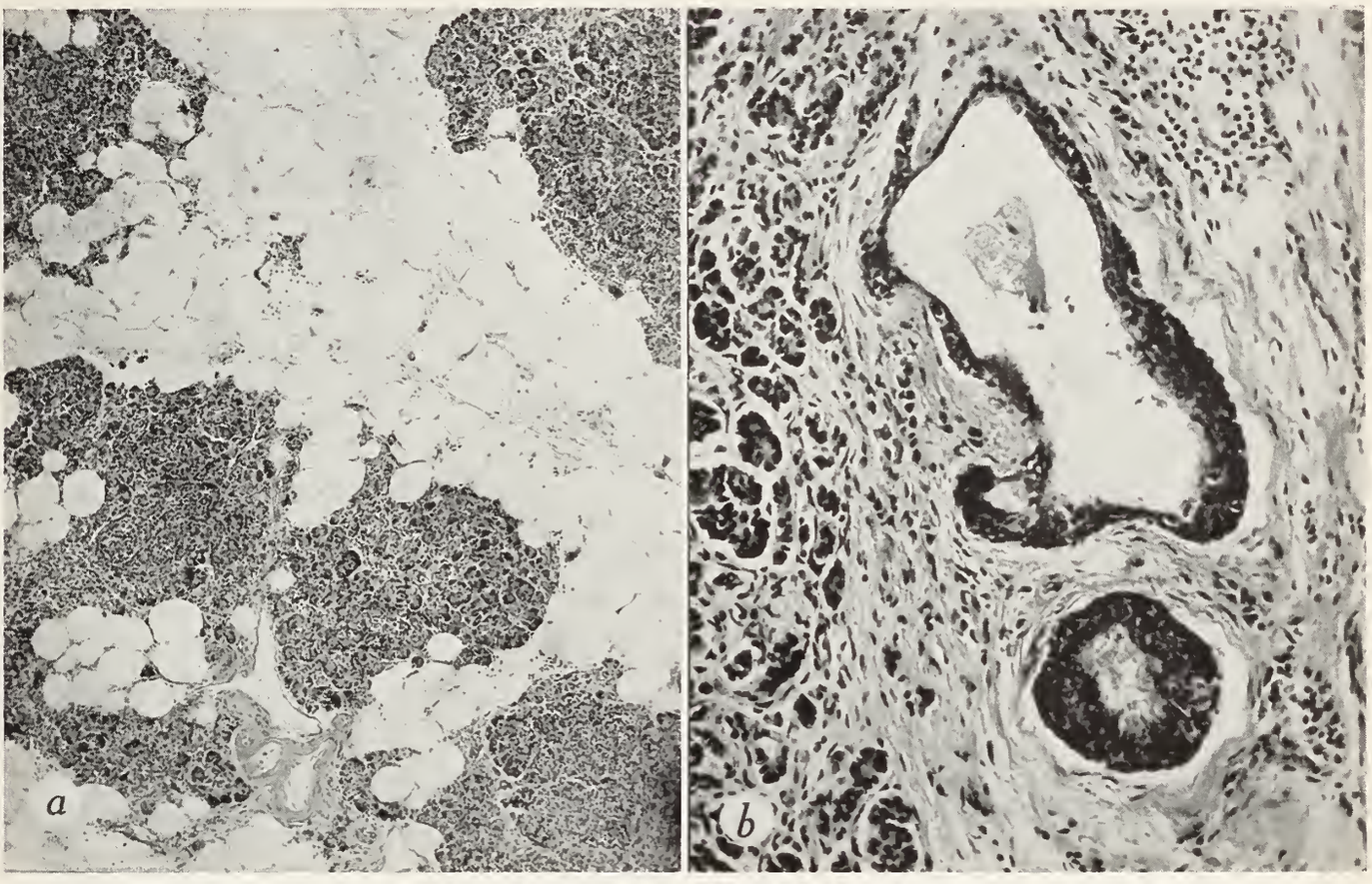


Fig. 1. *a*, Fatty infiltration of pancreas (x55); *b*, duct metaplasia; transition from columnar to stratified epithelium (x170).

Pituitary Body.—In considering the changes in the thyroid gland we said that acromegaly and adenomatous goiter were associated in two cases, in one of which there was clinical evidence of hyperthyroidism. Unfortunately, the number of cases in which the intracranial contents could be examined was small. No anatomic change of the pituitary body was observed. The brilliant studies of Houssay's and Young's experimental production of diabetes in dogs by the injection of extract of the anterior lobe of the pituitary body have prompted a careful study of this organ in cases of diabetes in which necropsy is performed, but thus far no changes of significance have been reported.[3,5,10]

Pathologic Changes in the Pancreas

Pancreatic Calculi.—Pancreatic lithiasis was encountered in two cases. In the first of these cases the patient was a man, aged fifty-four years, who had had severe diabetes for two years. In the other case, the patient was a man, aged forty-one years, who died of thrombosis of the

destruction and fibrosis of the pancreas. These changes no doubt were the result of obstruction and infection of the pancreatic ducts and secondary parenchymatous changes. In cases of pancreatic lithiasis it is probable, as Warren[13] and others have suggested, that despite damage to the acinar tissue the islands of Langerhans may be preserved for some time much in the same manner as they are in the pancreas of an animal after the pancreatic duct has been ligated.

Fatty Infiltration.—This lesion appears as large circular spaces near the vessels and scattered throughout the parenchyma (Fig 1*a*). It is obvious that extremely fatty regions would be avoided in preparing blocks of tissue for sectioning, but the lesion, when present, is probably an indication of acinar atrophy.

Pancreatitis.—This lesion is of two types: (1) interacinar, or diffuse, and (2) interlobular.

Metaplasia of the Pancreatic Ducts.—So-called metaplasia of the pancreatic ducts (Fig. 1*b*) was

noted in ten, or 5.7 per cent of the 176 cases. This incidence corresponds rather closely to that noted by Baló and Ballon. Warren[14] found this condition in nine of 484 cases. In our series of cases there was no evidence that the squamatization had caused occlusion of the pancreatic duct, but the sections were by no means sufficient to permit us to arrive at any definite conclusion.

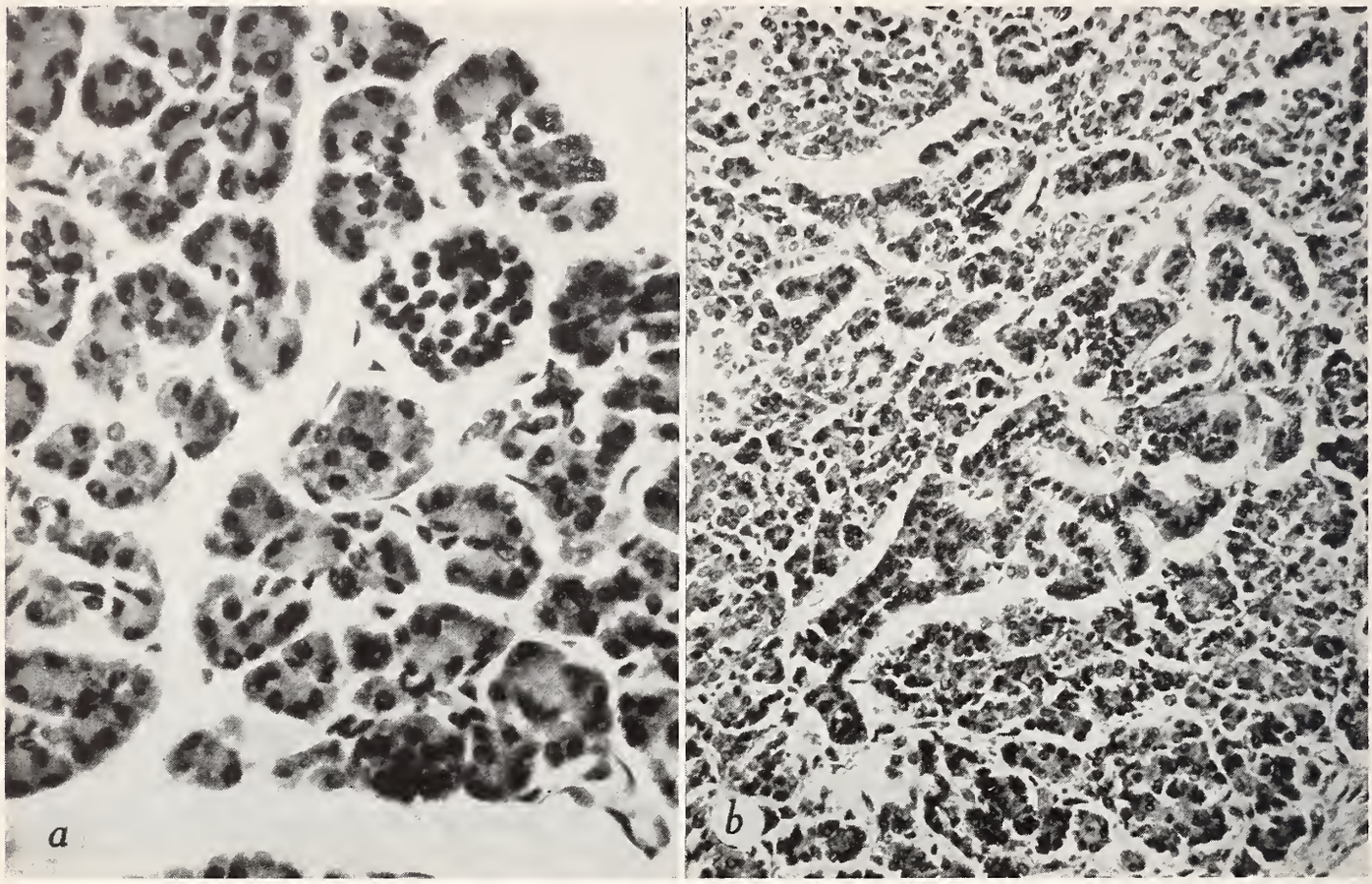


Fig. 2. *a*, Atrophy of islets (x430); *b*, so-called columnar or hypertrophic islets (x185).

Changes in the Islands of Langerhans.—Demonstration of typical changes in the islands of Langerhans in cases of diabetes mellitus has been the aim of many investigators. The object of this aim has been twofold: (1) to confirm the islet theory of the control of carbohydrate metabolism, and (2) to provide a microscopic method of diagnosis of this disease.

The results of extensive microscopic observations by many investigators may be summarized in a general way by stating that certain lesions of the islets are relatively, but not absolutely, diagnostic and that quantitative consideration of function should not be neglected. The latter necessarily implies ability to determine the presence or absence of function by the microscopic appearance of the islets. This determination has often been made without sound basis and it certainly has not been entirely successful.

In this study we made a special effort to observe the changes which had attracted the attention of previous investigators, and an attempt was made to compare these changes in the cases observed in the pre-insulin era and in the post-insulin era. Only certain changes were found to be significant in respect to these two groups of cases. This consideration will be limited chiefly to these changes.

Recent or old atrophy. The islets may be of normal size and be composed of cells with small hyperchromatic nuclei and with or without cytoplasm, or they may be small and compact (Fig. 2*a*) and be composed of small cells which at times are elongated and cells which contain small dense nuclei. In cases in which the cells contain small dense nuclei the postmortem changes offer the greatest hindrance to diagnosis. The presence of a few small dense nuclei, which were indistinguishable from true pyknosis, was encountered in both diabetic and nondiabetic tissue in a number of instances. The assumption that they represented postmortem changes was based

on the similarity to the histologic picture seen when pancreatic tissue was purposely left unfixed for periods which varied to as long as ten hours.

diagnostic significance could be attached to it. Hydropic degeneration is a reversible process[2] within certain limits, and only in cases in which

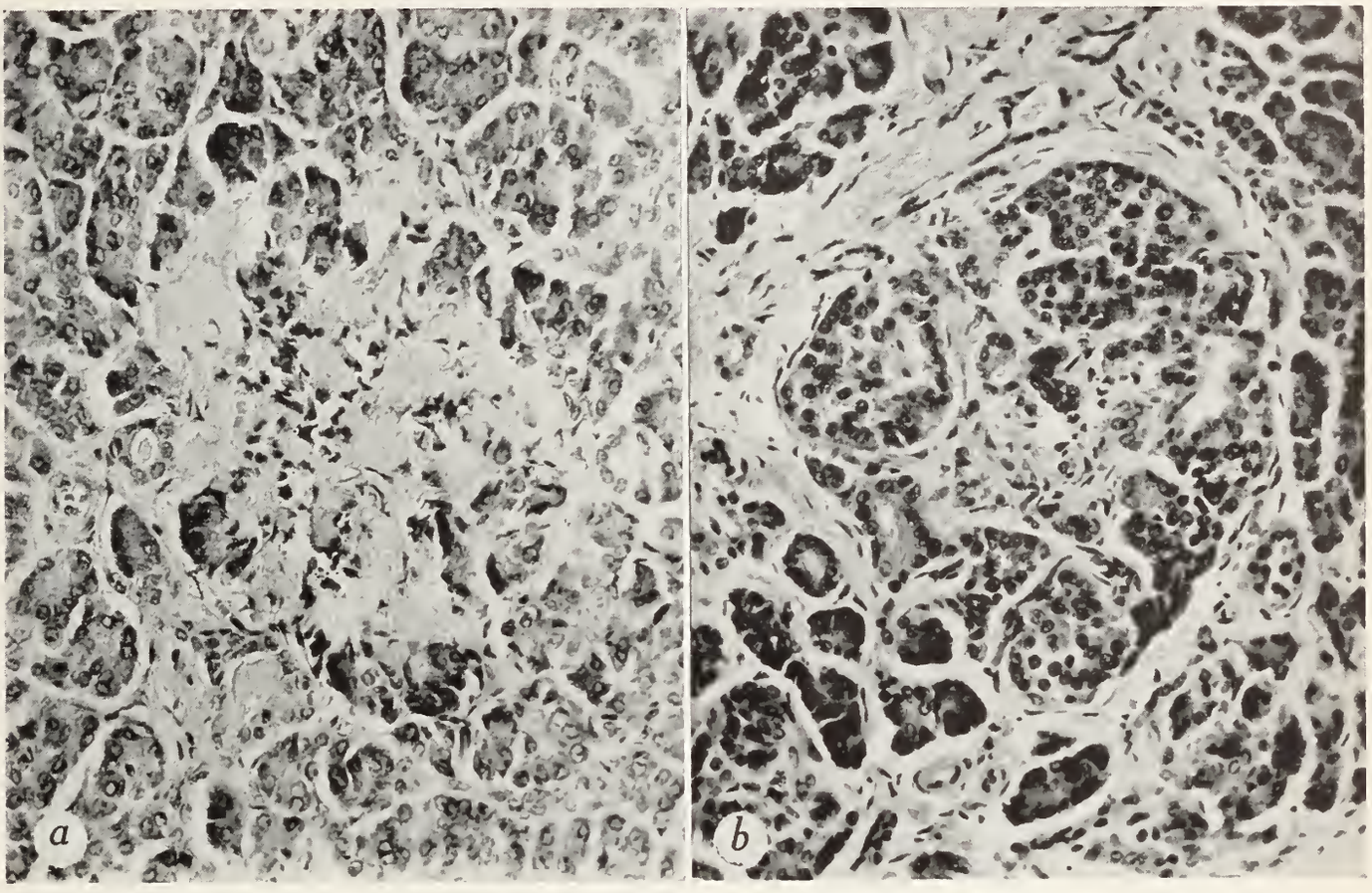


Fig. 3. *a*, Advanced hyalinization (x250); *b*, fibrosis (x235).

Therefore, acute degenerative change was diagnosed only when extensive pyknosis of the islet cells was more or less uniform as regards the stage of development. This was necessary because an average of 7.2 hours had elapsed before the pancreatic tissue was fixed.

Hypertrophy.—The occurrence of so-called columnar or hypertrophic islets (Fig. 2*b*) was noted without reference to degree. It was felt that approximation of the proportionate amount of columnar and simple islet tissue would not be of any significance. The application of some relatively precise method, such as that of Ogilvie, to measure the amount of each type of islet tissue might lead to conclusions regarding the functional value of the columnar portion of the islets. However, what appear to be transitional forms between the columnar and simple islet tissue occur and are difficult to classify.

Hydropic Degeneration.—In our material hydropic degeneration in the stage of vacuolation of the cytoplasm was so effectively imitated as well as concealed by postmortem changes that no diabetes is uncontrolled at the time of death can it be expected at necropsy. Even then it may be simulated by postmortem changes; although these changes may be identified by comparison with the adjacent acinar tissue and by the varying stages of apparent pyknosis, these criteria are by no means conclusive. Our inability to recognize the one lesion considered by many investigators to be of diagnostic significance in cases of diabetes mellitus, namely hydropic degeneration, was an early and definite conclusion.

Hyalinization and Fibrosis.—These changes are easily recognized. They require no comment other than to state that they are at times difficult to differentiate and to grade (Figs. 3*a* and *b* and 4*a*).

Lymphocytic Infiltration.—In our experience this change has been difficult to identify. While there frequently was definite evidence of lymphocytic infiltration in and about the islands of Langerhans (Fig. 4*b*), in many cases, particularly those in which the patients were young persons, there was a reasonable doubt concerning

its presence. Warren[16] expressed the opinion that this was the most characteristic lesion of the islands of Langerhans in cases of diabetes in which the patients were children.

study of the pancreas in 201 cases of diabetes, most of which are included in the 182 cases, and (3) a microscopic study of the pancreas in fifty consecutive cases in which patients did not have

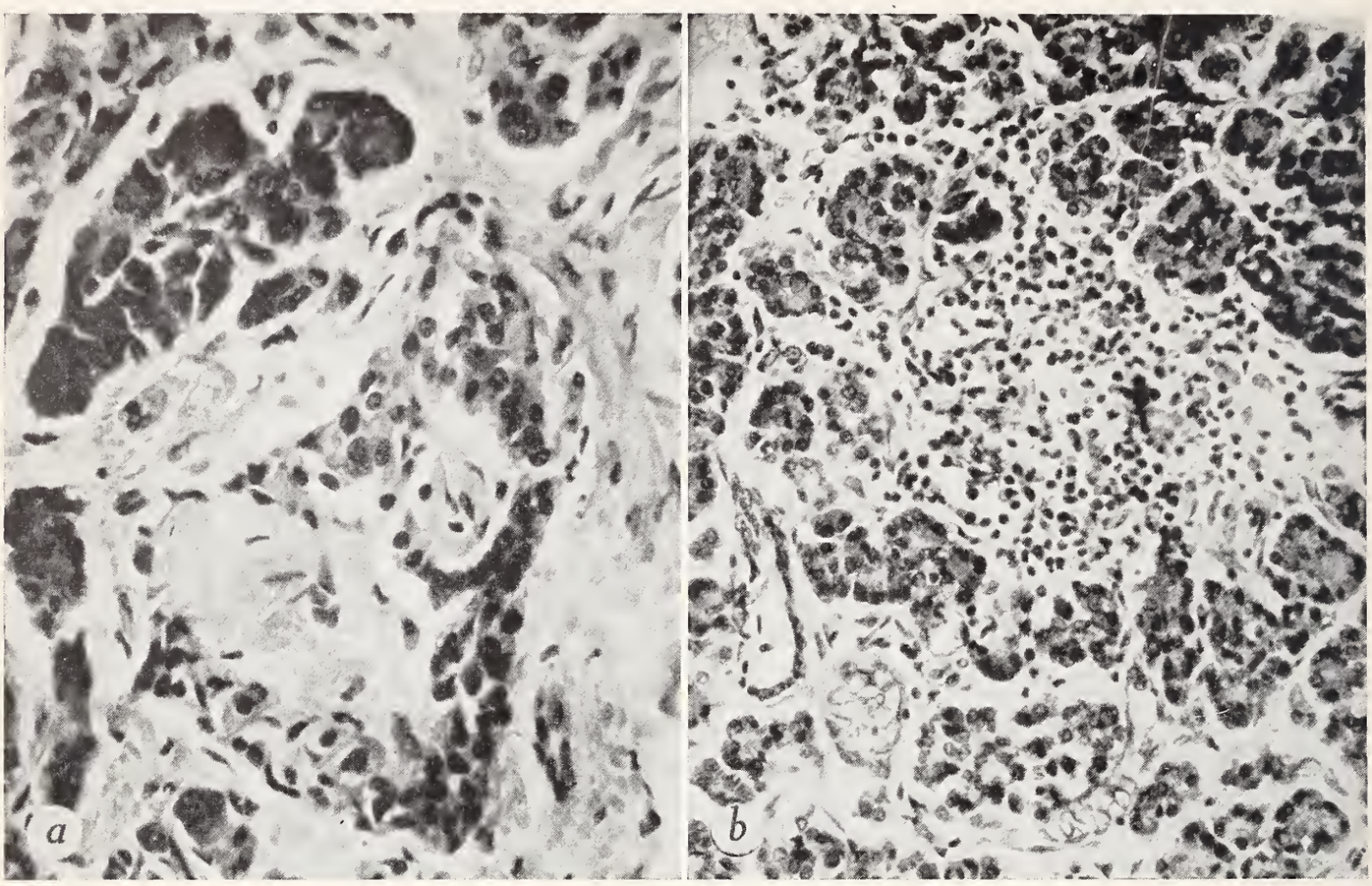


Fig. 4. *a*, Section showing the difficulty in determining the degree of hyalinization and fibrosis (x400); *b*, relation of lymphocytes to islands of Langerhans (x340).

Comment

One of the most interesting results of this study was the information gained by a comparison of the pathologic changes noted in the cases observed in the pre-insulin era and in the post-insulin era. The pathologic findings in these cases were checked with the findings in a control group of cases in which the patients did not have diabetes (Table III). In the cases of diabetes observed in the postinsulin era, the markedly increased incidence of atrophy, hyaline changes, and fatty infiltration, particularly in view of the lack of change in the incidence of pancreatitis, fibrosis and hypertrophic changes, may well be taken as an indication of increased degenerative changes and the results of longer life made possible by the administration of insulin.

Summary

This report is based on: (1) a clinicopathologic study of 182 cases of diabetes which were observed in the postinsulin era, (2) a microscopic

diabetes. In twenty-two cases the patients were in coma at the time of death; uncomplicated diabetes was present in only six of these cases. In the sixteen remaining cases hyperthyroidism or infection was present. Overwhelming infection, such as erysipelas, bronchopneumonia, cellulitis and septicemia, was the primary cause of death in thirty-four of the 182 cases. The incidence of advanced degrees of arteriosclerosis, especially of the medium-sized muscular arteries, in cases in which the patients were more than forty years of age was much higher than that reported for a series of nondiabetic patients of the same age. Our study revealed that the incidence of coronary sclerosis and arteriosclerosis of the extremities was higher among diabetic women than it was among nondiabetic women of the same age. The main reason for the higher incidence of serious vascular degenerative disease in the cases observed in the postinsulin era is the prolongation of life that results from the administration of insulin. This probably also accounts for the

TABLE III. POSTMORTEM FINDINGS IN CASES OF DIABETES MELLITUS OBSERVED IN THE PRE-INSULIN AND THE POSTINSULIN ERA AND IN A CONTROL GROUP OF FIFTY CASES IN WHICH THE PATIENTS DID NOT HAVE DIABETES

	No.	Postmortem findings and percentage of cases in which they were encountered							
		Atrophy of islets	Hypertrophy of islets	Hyalinization	Lymphocytic infiltration	Pancreatitis		Fibrosis	Fatty infiltration
						Interlobular	Interacinar		
Cases of diabetes observed 1914-1922	25	24	56	16	16	0	52	52	40
Cases of diabetes observed 1923-1937	176	44	48	39	5	8	50	48	71
Control group of cases	50	8	54	2	0	14	38	8	56

higher incidence of malignant disease and other diseases which commonly occur in the later decades of life. Carcinoma of the pancreas occurred with unusual frequency and the incidence of chronic disease of the gall bladder also was high.

Adenomatous goiter occurred in twenty-four cases. In six of the cases the goiter was classified as hyperfunctioning. Exophthalmic goiter had been diagnosed in three other cases. No significant findings were encountered in the pituitary body in the few cases in which this structure was examined. The number of cases in which the intracranial contents were examined was not representative.

Our results support the contention that certain lesions of the islands of Langerhans are suggestive but not conclusive in the pathologic diagnosis of diabetes mellitus. Our study also illustrates the inadvisability of generalization regarding any correlation of the microscopic appearance of the pancreas and the clinical severity or duration of diabetes. The microscopic study of the pancreas indicated that there was a relative increase in the incidence of atrophy, hyaline changes and fatty infiltration in the cases observed in the postinsulin era. These changes may well be considered dependent on the prolongation of life that results when patients are treated with insulin.

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BRUCELLOSIS*

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BRUCELLOSIS, a comparatively rare and little known disease of a few years ago, is gradually assuming an important and well recognized place in public health. The author well remembers that brucellosis was regarded as quite rare, a disease whose existence was considered only after most other diagnostic possibilities had been exhausted. Little did he expect to see ten cases within a period of eighteen months.

Brucellosis is still of minor importance to men practicing in cities where the milk supply is well controlled and where animal contacts are few. The importance of this disease is becoming more manifest to the doctor in farming communities, where, if the gradual increase of this disease is an indication, the incidence of Brucellosis will soon assume alarming proportions. The period of disability emphasizes the economic factor in this disease. Here lies the importance of more extensive public health control.

The history, etiology, and symptoms of brucellosis are common knowledge. The recognition of this disease occurred following the Crimean War and in 1863 Marston offered the first detailed description of "Mediterranean Remittent Fever." Bruce isolated the organism he named *Micrococcus melitensis,* by cultures from the spleen of a patient. The specific agglutination test was first offered by Wright and Semple in 1897. In 1904, the Mediterranean Fever Commission traced the disease to goats. Alice Evans, in 1918, found the Brucella and Bangs organisms to be the same.

This disease is caused by *Brucella melitensis, Brucella suis,* and *Brucella abortus,* depending on the variety found in goats, hogs, or cattle. The disease is spread rapidly from animal to animal with a complete lack of constitutional symptoms. The only manifestations of the disease are abortion and incomplete separation of the placenta. The organisms are found in lochia, products of abortion, urine, feces, and milk. Thus the avenues of spread are many. Some cattle with positive tests may not show other evidence of the disease. It has been estimated that 20 per cent of the cattle in the United States are affected. The lack of testing in hogs may account for the increased incidence of brucellosis among farmers and handlers of livestock. This lack of testing in hogs would also make the eradication of this disease among livestock all the more difficult—or well nigh impossible.

The incidence of brucellosis among handlers of livestock is much higher than might be expected. Pasteurization of milk for use as milk proper and milk products eliminates the possibility of spread through urban populations, except in those cases in which the milk supply is not so well controlled. In smaller communities pasteurization of milk is not carried out and therein lies one avenue of infection. The other avenues are the ones of paramount importance, however. The increase of the disease has come about in farmers, veterinarians, butchers, and livestock dealers. The possibilities for infection here are unlimited. Entrance to the body may come through breaks in the skin or by the oral route. Handling of abortion material in animals, of course, offers the richest field. Beattie studied a group of veterinarians, both students and practitioners. The incidence rose from zero in students who had not handled placentas to 26.2 per cent in veterinarians who had been in practice more than one year.

In 1922 the first epidemic of any importance in the United States occurred in Arizona. Since then the number of cases reported each year to the United States Public Health Service has increased. From only 112 cases in 1927, the number rose to 1,453 in 1930, and in 1937 to 2,497 cases. In Oklahoma the incidence has increased tremendously from two cases in 1930 to 431 in 1937. Only a portion of the cases are being reported since the chronic cases frequently go unrecognized. The reported deaths have not changed a great deal; 55 in 1930 and 58 in 1939. The only way to prevent further increase in infection is by control of the disease in animals. Cattle can be infected by varieties other than *Brucella abortus* and in similar manner can transmit the infection to man.

*Read before the annual meeting of the Southern Minnesota Medical Association, Red Wing, Minnesota, September 23, 1940.

Brucellosis is not a difficult disease to recognize if it is only borne in mind. This variety of clinical types, namely: (a) subclinical, (b) intermittent, (c) ambulatory, (d) relapsing, confuse the picture and it is for this reason that a great many cases go unrecognized. The incubation period averages about two weeks, though it may run from five to twenty-one days. The onset of the disease itself is generally insidious, but may be sudden. There is a progressive rise in fever with complaints of general malaise, chills, backache, abdominal pain, and weight loss. Examination may reveal only the fever, abdominal tenderness, leukopenia; and splenomegaly in about half the cases. Except for the aid of specific tests these signs and symptoms could be attributed to a number of conditions. Diagnosis may be confirmed by agglutination test, skin test, blood culture, and opsonophagocytic index. Of these the agglutination and skin test are carried out most easily. The agglutination test, as carried out by the State Board of Health, is considered by most authorities to be positive with an agglutination of 1.80 and upward. This positive reaction will occur within five to fourteen days of onset. The intradermal skin reaction is more valuable in those suspected cases in which the agglutination test is negative. This test is considered more reliable by some authorities. Huddleson, in a study of allergic skin tests on 8,124 individuals found 10.3 per cent to show allergic reactions indicating past or present infections. He felt that the agglutination test alone would fail to detect better than 80 per cent of these reactions. This skin test is carried out by the injection of a bacterial filtrate of Brucella origin, injecting .05 c.c. intradermally in the same manner as a Mantoux test. This test is also read in forty-eight hours.

These aids in diagnosis are especially important in the subclinical and chronic cases. Stress has been laid on the fact that many of the subclinical cases have been diagnosed as neurasthenia, a fact that is readily acceptable when one finds that the textbook description of neurasthenia fits that of Brucellosis, namely: exhaustion, insomnia, irritability, aches and pains. Brucellosis has also been confused with tuberculosis. The relationship between various orthopedic states and Brucellosis has been recognized for some time. Less than 10 per cent of all cases show a typical clinical picture for diagnosis.

The question of therapy has also been clarified considerably within the past few years. Among the various types of treatment suggested are artificial fever therapy, specific serum, intravenous dyes and sulfanilamide. The results from fever therapy have been none too encouraging although some good results have been reported both from the use of hypertherm and typhoid vaccine. Intravenous dyes have fallen by the wayside. Specific vaccine prepared from avirulent strains of *Brucella suis* or *abortus* has been used intravenously with reports of excellent results. Flippin reports the treatment of five patients with polyvalent antiserum, with good results in all five cases. He first tested the patients with 1 c.c. intramuscularly and if no reaction occurred in twenty-four hours, this was followed by six daily intravenous injections of 50 c.c. of serum given with 100 c.c. physiologic saline. This injection was allowed to take fifteen minutes time.

The most encouraging results in the treatment of Brucellosis have been reported by those using sulfanilamide and its derivatives. Some workers feel that the drug should be administered for one to two weeks after the temperature has become normal. It has been found that if therapy is discontinued too soon, relapse may occur. Improvement will begin to take place within three to eight days. Relapse has been reported two to three weeks after the interruption of treatment. Since Brucellosis is not a self-limited disease in a good many cases but may well continue into a chronic phase, therapy should be completely carried out. One author recommends short intermittent courses of sulfanilamide for two to three months after the fever disappears. Question might be raised as to the safety of this procedure.

Sulfanilamide was used in eight of the ten cases reported here.

In two of the ten cases triple typhoid vaccine was also used after use of sulfanilamide had been carried out for eight to ten days. After two bouts of fever these patients were returned to sulfanilamide therapy. The temperature soon dropped to normal and remained there. In five of these ten cases, it was found that the leukopenia became a mild leukocytosis after institution of sulfanilamide therapy. No differential counts were done. The white blood cell count after therapy was begun ranged from 8,400 to 14,000.

In one of the patients, sulfapyridine was substituted for sulfanilamide and used in the same manner as in the treatment of pneumonia. His temperature became normal within thirty-six hours and remained there. Sulfanilamide had been used for a period of eight days on this patient without any change in temperature.

Relapse was encountered in two of these cases. In one case relapse occurred twice, the first time two weeks after discontinuing sulfanilamide and the second time about three weeks after sulfanilamide had been discontinued. Temperature finally returned to normal and remained there. The sulfanilamide had been used for two weeks during each course of treatment. In this patient, the complaint of soreness and pain along the recti muscles was so severe, that some intra-abdominal lesion was considered. Soreness over the inguinal region persisted in this patient for six weeks after the temperature had returned to normal. Relapse in the second case was controlled more easily. Both patients eventually became afebrile.

All of the cases reported had definitely positive agglutination tests with dilutions ranging from 1:160 to 1:1280. In one case, that of a butcher claiming compensation, allowance of the claim as an occupational disease was made by the State Compensation Commission. All of the cases were acute, exhibiting a fever ranging from 101 to 103 degrees when first seen. The most common complaints were a feeling of chilliness and headache in the late afternoon and evening. Associated with these were symptoms of anorexia, malaise, aching, fever. Eight of the cases were handlers of livestock.

The only woman in the group was delivered of a healthy baby about fifteen months after the onset of fever. She too, had been treated with sulfanilamide. In the two patients who were neither livestock handlers nor milk drinkers, the source of infection could not be traced.

The local dairy was checked following the discovery of one case in town and it was found that out of a herd of thirty-two cattle there were twenty-one positive reactors to the Bangs' test. The fact that no other cases developed from this source is difficult to explain. Of course, as has been mentioned, many cattle may be positive reactors without having any other evidence of the disease. Mastitis with eventual contamination of the milk may not be present in many cases. Inasmuch as Bangs testing was not compulsory, suspected herds in only four of the cases were tested and found to contain positive reactors. In spite of the fact that they are well compensated for the loss of their stock, many of the farmers are none too coöperative. Only in breeding stock is careful testing being carried out regularly. The ease with which livestock is now transported, and the increased activities of traders and dealers, makes cross-contamination in herds a simple matter, and tracing of the source a more difficult one. The value of compulsory tuberculin testing in cattle is recognized by the farmer, but optional Bangs testing is not easily obtained.

Summary

1. Ten cases of Brucellosis are reported from a single small community within a period of eighteen months.

2. Eight patients were treated with sulfanilamide or sulfapyridine with good results.

3. There is an apparent increase in brucellosis among handlers of livestock.

4. More public health measures may be necessary to curb further increase in this disease.

SEMINAL VESICULITIS*

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THE importance played by the seminal vesicles in urogenital infections is not generally well understood. In recent years, the anatomical studies of the seminal vesicles and ejaculatory ducts made by McCarthy and his co-workers, and also the development of the instrument bearing his name have done much to establish a better knowledge of the pathology involved in seminal vesiculitis and to establish a rational method of treatment. Herbst and Merricks have done well to point out in their many excellent publications the satisfactory clinical results they

*From the Interstate Clinic, Red Wing, Minnesota. Read before the annual meeting of the Southern Minnesota Medical Association, Red Wing, Minnesota, September 23, 1940.

have obtained by catheterization of the ejaculatory ducts.

Almost all infections involving the prostate gland, both acute and chronic, also involve the seminal vesicles. The seminal vesicles depend on their drainage from the ejaculatory ducts which course through the substance of the prostate gland to empty into the prostatic urethra. Because of the close proximity of the seminal vesicles to the prostate it is not difficult to see how organisms causing prostatic infection traverse the ejaculatory duct and enter the seminal vesicles. Often in acute prostatic infections the prostate gland becomes edematous and engorged, thus mechanically occluding the ejaculatory ducts. In chronic infections the ducts often are not patent due to fibrous adhesions or purulent plugs. When these circumstances exist the seminal vesicles become distended with purulent material and are found wanting for adequate drainage.



Fig. 1. Abscesses of left seminal vesicle.

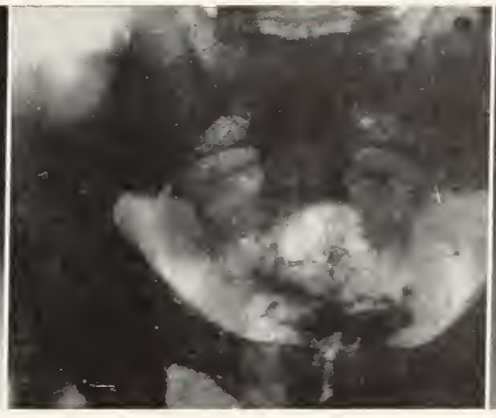


Fig. 2. Same patient as in Figure 1. Vesiculogram taken two months later. Drainage has taken place and massage given twice a week. Right seminal vesicle partially filled.



Fig. 3. Same patient after five months of treatment. Practically normal left seminal vesicle and vas deferens.

The organisms which most often cause seminal vesiculitis are staphlococci and colon bacilli. Undoubtedly these organisms, in many cases, come as secondary invaders to gonococci.

The symptoms of seminal vesiculitis are variable and depend, to some degree, on the amount of pus trapped in the seminal vesicles. Also the symptoms may be intermittent due to partial drainage of the seminal vesicles. Recurrent attacks of unilateral or bilateral epididymitis are pathognomonic symptoms. Indefinite, lower abdominal pain, backache or perineal pain, itching or a crawling sensation in the perineum may all be manifestations of infected seminal vesicles. Because of the close relationship of the seminal vesicles to the lower ureter, obstructive symptoms of the upper urinary tract may exist. Hemospermia may attract attention to the seminal vesicles as a source of infection. Sterility in the male can, at times, be explained by this type of infection.

Patients suffering from seminal vesiculitis often have had prolonged treatment by prostatic massage, urethral dilatations and instillations. The urine, perhaps, has been intermittently cloudy and clear, which, in some cases, indicates the amount of drainage from the seminal vesicles. Very often a patient will give a history of epididymal pain following massage. When the ejaculatory duct is plugged, massage churns up the infection and causes pus to travel down the vas deferens to the epididymis.

As was stated previously the method of treatment is one of adequate drainage. Vesiculotomy and vasotomy have now been replaced by transurethral catheterization of the ejaculatory ducts. This is accomplished by use of the panendoscope with the McCarthy attachment. This instrument permits small catheters or bougies to be introduced into the ejaculatory ducts. Through these catheters pus may be aspirated to determine the causative organism. It is not an uncommon experience after catheterizing the ejaculatory ducts to find pus emerging from the catheter. Also visualization of the vesicles is accomplished by injecting opaque media, such as diodrast, into the catheters and making roentgenograms of the vesicles. Such visualization gives one information as to the presence of abscesses in the seminal vesicles and, in some cases, the patency of the vas deferens. Medication such as silver nitrate

may be introduced through the catheter to lavage out the vesicles.

This procedure is carried out under local anesthesia of 0.5 per cent cocaine, or caudal block using 1 per cent novocaine. A panendoscope with the McCarthy attachment allows ureteral catheters to be directed down, back and inwardly into the ejaculatory ducts. Buckling of the catheters is obviated by introducing piano wire into the lumen of the catheters to give them support. The ejaculatory ducts are approximately 2.0 to 2.5 cm. in length. The arrangement of the ejaculatory ducts vary, depending on the depth of the utricle. In some instances it is difficult to ascertain which duct is being dilated before taking roentgenograms. To visualize the seminal vesicles 2 c.c. of diodrast is usually sufficient to inject into the catheter to obtain a satisfactory roentgenogram. The ejaculatory ducts are catheterized separately as it is not possible to insert two catheters simultaneously. Generally speaking, little or no reaction follows this procedure. However, it should be emphasized that it is usually necessary to dilate the ejaculatory ducts several times to establish adequate drainage.

Case Report

R. L., age twenty-nine, was first seen in January, 1940, complaining of recurrent attacks of bilateral epididymitis, backache and a crawling sensation in the perineum. He stated that the symptoms began six months previously. There was no history of gonorrhea. The urine was slightly cloudy and microscopically there were 8 to 10 pus cells per low power field. The prostate and seminal vesicles were rather soft, boggy and tender. A diagnosis of chronic prostatitis and seminal vesiculitis was made. Massage, twice a week, for a period of eight weeks gave no relief. In April, 1940, the ejaculatory ducts were catheterized and pus aspirated through the catheters. The seminal vesicles were visualized (Fig. 1), and dilatation of the ejaculatory ducts was carried out on several occasions (Figs. 2 and 3) at intervals of one month. The last vesiculograms appeared to be normal. The patient is symptom free except for a slight pain at times in his right epididymis.

Summary and Conclusions

1. Prostatic infection and seminal vesiculitis are closely associated.
2. The seminal vesicles depend on drainage from patent ejaculatory ducts.
3. Transurethral catheterization of the ejaculatory ducts with visualization of the seminal vesicles provides a means of determining the extent of disease present and allows drainage of the seminal vesicles.
4. A case which was successfully treated is reported.

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◆ CASE REPORT ◆

AN INTERESTING CASE OF TRICHOMONAS VAGINALIS IN THE MALE

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In most cases of trichonomas vaginalis in the male, either a urethral discharge or burning in the urethra at the end of urination and frequency of urination are present and it is these symptoms which cause the patient to seek medical advice.

In the case to be reported none of the above-mentioned symptoms were present, in fact, the patient never knew that he had this infection, but came on account of sterility. A routine examination of the prostatovesicular secretion obtained by massaging the prostate and stripping the seminal vesicles showed numerous live typical trichomonas vaginalis.

The patient was a dentist who did much x-ray work without any protection of his testicles. He was referred to me on account of sterility. He had been married three years, and his wife had had a child with a previous husband about seven years ago. He also complained that emission comes some time after orgasm, otherwise his coitus is normal. A condom specimen was examined about four years ago, and he was told that it showed motile spermatozoa but he did not know whether the number of spermatozoa was normal. His penis, testicles and prostate appeared normal to palpation. The expressed fluid however showed some spermatozoa most of which were dead and those that were alive showed only feeble motility.

(Continued on page 144)

HISTORY OF MEDICINE IN DAKOTA COUNTY

Biographies

(Continued from January issue.)

O. A. Beal located in West Saint Paul about 1896. He had previously practiced in Saint Paul. He was a graduate of Long Island College Hospital (1882). He served as a county physician for Dakota County.

J. G. Bemis came to Farmington from New York City in the fall of 1867. It is uncertain how long he practiced there.

T. N. Berlin was a homeopathic physician of Empire where he located in the latter sixties.

Robert Blakeley was the first practicing physician in Nininger Village, according to the county history by Franklyn Curtiss Wedge.

J. D. Brundage came from Naugatuck, Connecticut, and practiced in Hastings and in Lakeville toward the end of the seventies.

J. P. Caldwell was born in Illinois in 1848. At the age of sixteen he entered the army and served until the end of the war. He graduated from the Bennet Eclectic Medical College in 1874 and a few years later he came to Minnesota. He practiced medicine in Lakeville from 1882 until 1889, when he moved to Saint Paul.

Charles Cappellen, formerly of Brandon, Minnesota, opened an office in Hastings in 1899. He had the habit of advertising, modestly but persistently, in the newspapers.

R. E. Cavanaugh was graduated from Rush Medical College in 1894 and practiced in Hastings the following year.

F. D. Chapman, a homeopath, came to Hastings in 1870.

W. H. Cooke located in Lakeville in 1891. He served several terms as a county physician and as coroner. He was a graduate of Queen's College, Kingston, Canada (1888).

D. J. Cummings graduated from the Chicago Medical College and came to Farmington in the fifties. His professional card appeared in the *Dakota Weekly Journal* in June, 1856, but he may have come earlier. In 1871 he reported a case of leprosy which created considerable excitement in the locality. He later practiced in Hastings, Waseca and Northfield for short periods and then returned to Farmington in 1877. He was instrumental in the organiza-

tion of the Dakota County Medical Society and was an active member of both that and the state society.

J. Davidson, an eclectic physician, practiced in Hastings in 1868.

A. C. Dockstader, a homeopath, graduated in 1880 from Hahnemann Medical College and located at South Park, Dakota County. He practiced at various times in Granite Falls, Red Wing (1886), Minneapolis (1887-1889) and Saint Paul (1892-1896). The intervening periods were spent at South Park, Dakota County. He served as a county physician.

Levi P. Dodge was born in Sunapee, New Hampshire, in 1839. He was left an orphan at the age of six months and cared for himself from the time he was eight years old. At the age of twenty-two he began to study medicine with Dr. S. M. Whipple of New Hampshire. He enlisted in the New Hampshire Volunteers in 1861 and was given a position as hospital steward. He was at the second battle of Bull Run, Antietam and Fredericksburg but was discharged in 1863 because of ill health. He received a diploma from Dartmouth the next year and after practicing in New Hampshire for a short time he came to Farmington in 1865. His professional card, typical of the early physicians, announced that calls would be "promptly attended to, whether by day or night and 'no postponement on account of weather.'" He was a charter member of the Dakota County Medical Society, serving as president in 1878, and a charter member of the Minnesota State Medical Society. He was a member of the school board of Farmington for twenty years and served also on the board of control for the state public schools for dependent children. His death occurred in September, 1893, following an operation for cancer of the bladder.

William M. Dodge began to practice in Farmington about 1894. He often served as a county physician.

W. R. Endris of St. Louis practiced in Hastings in 1887.

F. B. Etheridge located in Hastings in May, 1860, having had, according to his professional card, thirty years' experience in his profession. During the war he was a surgeon with the rank of major in the Fifth Regiment of Minnesota Volunteers. He was taken prisoner near Corinth, Mississippi, and returned to Hastings in 1862 to resume his practice. He served as county physician, was a charter member of the county medical society and became affiliated in 1870 with the state society. He died in 1874.

J. H. Etheridge was a professor of Materia Medica and Medical Jurisprudence at Rush Medical College in 1869. The newspapers refer to him as being "formerly of Hastings." He died in Chicago in 1899 of heart disease.

Warren C. Eustis was born in 1847 in Boston, Massachusetts, and in 1855 moved to Minnesota with his parents. He attended the state university and was one of its first graduates. He received his medical training at the University of Michigan and the Bellevue Hospital Medical College, from which he obtained his diploma in 1877. He practiced in Farmington until 1891 when he moved to Owatonna and specialized in eye and ear work. He was a versa-

tile linguist, being able to converse with his patients in English, German, Norwegian, Danish and Swedish. He was a member of the Dakota County Medical Society, the Steele County Medical Society and the state medical association.

C. A. Faulkner practiced in Rosemount in 1900 and was in that year appointed county physician. He was a graduate of the Bennett Eclectic Medical College.

A. A. Finch began practice with his father, J. E. Finch, in Hastings in 1891. In 1894 he opened an office in Rosemount and divided his time between that town and Hastings. Shortly afterwards he moved to Blooming Prairie. He was a graduate of the University of Minnesota and had received his medical training at the University of Pennsylvania (1891). He was elected Dakota County coroner in 1892. He was a member of the National Association of Railway Surgeons, the pension board, and the Steele County Medical Society.

Jeremiah E. Finch was born in Ontario in 1829. He came to Hastings in 1856 having previously practiced in Illinois and Wisconsin. In 1862 he was appointed a surgeon with the rank of major in the Seventh Minnesota Infantry and the next year he returned to Hastings where he became one of the leading practitioners. He ran a drug store which he established early in the sixties and which later was known as Finch and Son. He was a member of the local hunting club, a Mason and a Knight Templar. In 1866 he was elected mayor of Hastings and he served a long term as the president of the Hastings school board and in other public offices. He was one of the first members of the county medical society organized in 1870 and served as its president in 1875 and in 1876. He was a charter member of the Minnesota State Medical Society and its president in 1878. In 1886 he was appointed physician for the Chicago, Milwaukee and Saint Paul Railroad.

Julius C. Fitch, a graduate of Rush Medical College (1866), was one of the early physicians in Hastings. He was among the first members of the county medical society and served as county physician, health officer for Hastings, and president of the Hastings school board. In 1871 he was elected to membership in the Minnesota State Medical Society.

Thomas Foster, a pioneer physician in Dakota County, was a man of varied abilities. He visited Olive Grove, the present site of Hastings, in 1850 and the next year built a home for himself which, excepting the trading station, was the first house in that vicinity. In 1852 he was appointed physician to the Sioux Indians. He was the editor of a newspaper, the *Minnesotan,* published first in Hastings and later in Saint Paul and Duluth. Besides practicing medicine he also was state librarian, a member of the constitutional convention, and private secretary to Governor Ramsey under both territorial and state administrations.

Doctor Foster was born in Philadelphia in 1818 and died in San Francisco in 1903.

C. P. Fuller came to Hastings at the age of fourteen. He entered the drug business and continued in it until about 1869 when he went to Philadelphia to study medicine. Returning to Hastings he again followed the drug business until the fall of 1874 when he went to Granite Falls, Minnesota, to prac-

tice. He died of gangrene poisoning in August, 1879, at the age of thirty-nine. He was a member of the Dakota County Medical Society.

W. W. Furber, a graduate of Rush Medical College, practiced in partnership with Dr. C. P. Adams in Hastings from May, 1878, until August, 1879. He later practiced in Cottage Grove, Washington County. He was elected to the Minnesota State Medical Society in 1878.

William Gibson practiced in Hastings in 1856.

R. F. Goodwin practiced with Dr. C. P. Adams in Hastings in 1869 and later moved to Cannon Falls, Goodhue County.

Elizabeth Graves was legally authorized to practice under the "years of practice act." She lived in Hastings during the eighties.

James Gravelly, a German physician from Iowa City, Iowa, came to Hastings in 1887. Apparently he did not stay long. Two years later he was in Young America. He was graduated from Iowa State University in 1887.

Henry Hahn located in Hastings in 1884. He practiced under an exemption certificate and previously had lived in Young America. In 1887 he served as city health officer and as county physician. The following year he opened an office in Saint Paul and several years later moved to Saint Cloud.

E. W. Hammes was born in Wisconsin in 1854. He graduated with honors from Rush Medical College in 1882 and practiced at New Trier and at Hammond in Dakota County. In 1900 he went to Chicago to take some postgraduate work. He served several years as a county physician. About 1926 he retired from practice and moved from Dakota County to Saint Paul. He died in October, 1934.

E. Hammond was born in Connecticut in 1819. He went to River Falls, Wisconsin, in 1855 and two years later came to Waterford where he lived on his farm, with the exception of two years spent in Minneapolis, until his death.

A. H. Hanchette was one of the pioneers of Hastings. He was an eye and ear specialist, according to his card, and was for a time associated with Dr. Wm. Thorne. He was elected the first mayor of Hastings in 1857 but resigned from the office and soon after left for the East. In 1864 he served as geologist for the State of Minnesota.

G. H. Hawes was born in Massachusetts in 1832 and in 1855 came to St. Anthony, Minnesota, where he engaged in mercantile pursuits and the lumber business until about 1866, when he began to study medicine with Dr. C. G. Higbee of Red Wing. He graduated from the Hahnemann Medical College of Chicago and after three years of practice in Iowa, located in Hastings in 1876, where he became one of the leading homeopathic physicians. He served as secretary of the Minnesota State Homeopathic Institute in 1881 and 1882. He died in 1892 of cancer of the mouth and throat.

A. B. Hawes of Hastings was graduated from the Hahnemann Medical College in 1890 and located at Elk Point, South Dakota. In 1892 he returned to Hastings and took over the practice of his father, Dr. G. H. Hawes, during the latter's fatal illness. He remained somewhat over a year. He was a member of the state homeopathic society.

V. J. Hawkins practiced in South Saint Paul and served as a county physician for Dakota County in 1889. He was a graduate of Rush Medical College (1881). He now resides in Saint Paul.

P. A. Heitz was born in Germany in 1820, received his medical degree in 1846 from the University of Heidelberg and practiced there until his coming to the United States a year later. He spent one year in Ohio and practiced for a while in Hannibal, Missouri. He was a member of the Marion County Medical Society (Missouri) and vice president of the State Medical Association of Missouri. He came to Hastings in 1880 where he was for a while collector of assessments for the Detroit Mutual Benefit Association. He served as county physician and finally established himself as one of the leading practitioners of the town. He was elected to the Minnesota State Medical Society in 1883. In 1886 he moved his office to West Saint Paul. His death occurred in Saint Paul in 1888.

Joseph George Hodgkinson was born in Ontario, Canada, in 1845. He was graduated in 1879 from the Detroit Medical College and he also attended the medical college of the University of Michigan. From 1880 to 1882 he was treasurer of the Pension Board of Examining Surgeons at Detroit, Michigan. The following year he came to Saint Paul where he attended the Saint Paul Medical College. He practiced at Battle Lake, Taylors Falls, St. Croix Falls, and Saint Paul. In 1895 he opened an office in South Saint Paul. In 1897 and 1899 he served as a county physician.

Hartland C. Johnson came to Farmington from Northfield in 1885. He graduated from the Chicago College of Physicians and Surgeons. He later moved to Saint Paul.

W. F. Kertson practiced at Mendota in 1886 and 1887. He was a graduate of the medical department of the University of Victoria, Canada (1882).

L. M. J. Leonard came to Hastings in 1870 from Kenosha County, Wisconsin.

R. L. Marvin was one of the pioneers of Hastings. He came in the early sixties and ran a drug store for many years. In 1875 he was elected to membership in the Dakota County Medical Society and served as both secretary and treasurer of the organization for several years.

W. W. Memminger practiced in Rosemount in 1899 and served as a county physician.

C. F. Miller practiced in Hampton in 1899.

A **Dr. Munson** practiced at Pine Bend near Inver Grove during the latter sixties and early seventies.

A **Dr. Nichols** practiced with Dr. C. C. Righter in Hastings in 1863, having previously practiced in Prescott. This may be the same as the Dr. Ziba Nichols who was also in Dakota County in the sixties.

A. G. Phelps was a homeopath who practiced in Hastings in the latter nineties. He was a member of the state homeopathic society.

Horace Phelps, according to Neill and Williams' history of Dakota County, came to Lakeville in 1856.

T. G. Potts came to Castle Rock in 1856 and practiced there until 1863.

C. C. Righter, a homeopathic physician, located in Hastings in 1862. About 1868 he went to Faribault for three years and then, after another period in Hastings, again went to Faribault in 1879.

Peter Schneider began practice in Hastings about 1890. In 1894 and 1895 he was very active in the office of city health officer. In 1897 he received a diploma from the Wisconsin Eclectic Medical College. After a trip to Germany in the summer of that year, he moved to Saint Paul.

F. P. Shillock (*see* History of Medicine in Carver County).

J. Dennis Smith, a graduate of the University of Pennsylvania, came from Philadelphia in July, 1870, to practice in partnership with Dr. C. P. Adams of Hastings. He was one of the charter members of the county medical society. He returned to Philadelphia in 1871.

Jenks S. Sprague was born in Otsego County, New York, in 1800. He graduated from the College of Physicians and Surgeons of Western New York and after practicing in Schoharie County for a few years he became a partner of Dr. Naboth Buckingham of Exeter, with whom he had formerly studied. In 1854 he returned to Otsego County where he remained until 1863 when, his health failing, he came to Hastings, Minnesota, to retire from active practice. In 1854 he served as president of the New York Medical Association and was greatly influential in legalizing the practice of dissection in that state. He was also a member of the American Medical Association and a member of the New York state legislature (1853). He served as president of the Dakota County Medical Society from the time of its organization until 1874 and was the first honorary member to be elected to the Minnesota State Medical Society. The many positions of honor which he held bear witness to the esteem in which he was held both as a physician and as a man.

Otto Stannis, a homeopathic physician, located in Hastings in 1859. He had received his education in Germany and had practiced in both that country and this before coming to Minnesota.

A **Dr. Straussman** divided his time between Hastings and Stillwater in the latter seventies. His qualifications as a physician are unknown.

Wilfred O. Tessier was graduated from the College of Physicians and Surgeons, Minneapolis, in 1887, and located at Mendota. He opened a drug store there in 1889.

William Thorne, one of the well established and one of the oldest practicing physicians of Hastings, was born in Devonshire, England, in 1820. He came to New York State in 1834, studied with several physicians and took a preliminary course of lectures at Buffalo College in 1847. After practicing for a year and a half he returned to Buffalo and received his degree of Doctor of Medicine in 1850. In 1856 he came to Hastings where he established a drug store. He was one of the first members of the county medical society, of which he was president in 1874 and in 1877, and also a charter member of the Minnesota State Medical Society. He served several terms as county physician and was a member of the pension board. About 1899 he and his wife moved to Covina, California.

A **Dr. Thompson,** a graduate of the University of Pennsylvania, for a time in the late fifties was associated with Dr. Thorne of Hastings. He also practiced for a time at Hudson and Superior, Wisconsin.

W. H. Thurmond, a physician from Dowville, Iowa, practiced in Rosemount in 1879. About 1881 he moved to Brownton, McLeod County, and then to Athens, Georgia (1885).

A **Dr. Torgerson** was a practicing physician in Empire in 1868. He also ran a dry goods store.

James M. Tucker began to practice in Hastings about 1886. He was an enthusiastic member of the Loyal Legion and the G. A. R. and filled various offices in the latter organization. He served as health officer in Hastings for several terms, and for many years was a county physician. He was also appointed to the pension board (1891). He was a member of Company E of the National Guard.

Henry Van Beeck opened an office in Hastings in 1889, two years after his graduation from Rush Medical College. He was elected county physician and health officer for several terms. He also served as coroner and as a member of the pension board. He was affiliated with the State Medical Society.

H. D. L. Webster, a homeopath, came to Hastings to practice in 1867. Previously he had practiced in Winona and a year later he moved to Little Rock, Arkansas.

Robert L. Weems, physician and surgeon, came to Hastings in 1867. For many years he ran a drug store there. He was a charter member of the Dakota County Medical Society.

J. M. Whipple came to Hastings in 1857. According to his professional card he specialized in ophthalmic surgery. He also sold drugs and medicines.

Thomas S. Williamson (*see* "The Missionary as Practitioner," Minnesota Medicine, October, 1940).

William Willson was a practicing physician in Hastings in 1868.

(To be continued in March issue.)

President's Letter

YOUR COMMITTEE APPOINTMENT

THE Minnesota State Medical Association is made up of approximately two thousand six hundred members working through a setup which calls for officers and committees. These committees are again subdivided into scientific, non-scientific, and those on medical economics; as fine a democratic enterprise as can be found in any organization of a similar nature.

These committees cover every phase of economic and scientific endeavor in which medical men can be interested, and to be appointed to a committee should be, and can rightly be, considered an honor. But such honor is of no value unless a man feels the necessity of lending not only his support but his presence at committee meetings. The Association needs every man's constructive view in committee deliberations, especially in these momentous times. Once a man gets into the swing of medical thought in this state, he will miss the enthusiasm of committee contacts if unable to attend.

Medical education is not only undergraduate but must continue through a medical man's entire professional life as shown recently in the deliberations of the Committee on Child Health, when there was a thorough discussion of the plan for the course on The Problems of the Premature and Unborn Infants at the University. An enthusiastic committee meeting with much constructive thought resulted.

The survey of human tuberculosis and its follow-up in Meeker County, Minnesota, was outlined under the supervision of the Committee on Tuberculosis at their monthly meeting with the physicians of the locality in Litchfield. When completed, this will bring national recognition and be of untold benefit to the people of our state.

That we are vitally interested with the Minnesota Safety Council in the prevention of accidents, especially those of motor vehicles, was brought out forcefully at the annual meeting of this Council when it was shown that heart disease, 24.7 per cent, cancer 13.6 per cent, and cerebral hemorrhage 8.5 per cent, are followed a close fourth in Minnesota by accidents, 7.7 per cent, as the cause of death. Our Committee to Study Motor Vehicle Accidents can well be an integral part of their state-wide setup. Preventive surgery is its aim.

Outside of organized medicine, but still a very closely affiliated corporate part, is the National Physicians' Committee for the Extension of Medical Service. It is fundamental that we recognize immediately the need of supporting this committee in its work of acquainting the public with the gains in medical practice and the necessity of the patient-physician relationship as against state controlled medicine. An investigation of its work not only makes one enthusiastic about but a financial supporter of this worthwhile endeavor.

An exchange of ideas in local societies will soon wear away the barrier of indifference and each individual, as well as the society as a whole, will be the gainer; but each one should attend his committee appointments without fail. Democracies are controlled by the associational ideas which are freely given in committee or other similar bodies deliberating for the good of the whole. There is something of interest happening which you lose by not attending. Your committee chairman and the officers need your help as well as criticism. Dictators or inside cliques will find no place in any association where well functioning committees are found.

B. J. Branton, M.D., *President*
Minnesota State Medical Association

Editorial

MINNESOTA MEDICINE

Official Journal of the Minnesota State Medical Association

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BUSINESS MANAGER
J. R. Bruce

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TREACHEROUS TUBERCULOSIS

ATTENTION is called to an article by Laird in this number of Minnesota Medicine which merits emphasis aside from the Malmros-Hedvall concept described therein.

It is another appeal for the detection of early tuberculosis of the lungs, pointing out again that contacts furnish the richest source of potential disease. It is a warning that beginning tuberculosis in the main produces no symptoms. It demonstrates how frequently these early, symptom-free lesions may go for months to a year or more before giving symptoms. It teaches that in many instances there are no distinctly differentiating characteristics between primary phase tuberculosis and reinfection phase tuberculosis and that most certainly all primary phase lesions are not benign as many observers have been insisting.

It is also clear from the material which Laird presents that, as in the treatment of pulmonary tuberculosis so in the correct clinical interpretation of the early latent lesion, time is the essence of the contract as prolonged observation is often necessary.

Two additional points may well be stressed. First, that not infrequently outspoken clinical disease may develop in but a few weeks subsequent to an initial infection. This occurs not only in infants but in adults as well. Second, that some of these minimal reinfection phase lesions with no treatment will disappear or fade out to the point of becoming fibrous, strand-like areas.

Finally, it should be reiterated that this and similar papers clearly demonstrate that we are in an era when by going out and searching for tuberculosis we are encountering problems which are new, requiring judgment of the highest order from the practising physician. It is distinctly another period in the fight against this insidious, treacherous and unpredictable disease.

—E.K.G.

VENEREAL PROPHYLAXIS

IN HIS autobiography, reviewed elsewhere in this issue, Hugh Young tells the intimate details of the way in which, for the first time in the history of warfare, a serious and effective attempt was made to control the incidence of venereal disease among the troops. It is a fascinating story of careful planning by a master mind backed by competent authority.

Young went to France with the first military contingent from the United States, six weeks after we entered the war. General Pershing and his staff were on board and from first to last the Commander-in-Chief gave his unstinted support to Young's proposals. Everyone knows the result. Venereal disease in the A. E. F. was held to a minimum throughout hostilities, an unparalleled record in military history.

Hugh Young has done many things of importance in his long and useful career but nothing

he has ever accomplished bears any comparison, for far-reaching benefit, to his skill and persistence in carrying out his ideas in the prevention of venereal disease. It furnished an example for the whole civilized world of what could be done by carefully applied scientific knowledge, properly enforced.

Now that we are again mobilizing a large force, regardless of whether war comes or not, it is to be devoutly hoped that the lessons of 1917 and 1918 will be clearly remembered and utilized. Anything less will be a disgraceful reflection on our national intelligence.

GILBERT COTTAM

SULFATHIAZOLE

JUST a year ago we published an editorial entitled "Sulfapyridine and Pneumonia"* calling attention to the value of sulfapyridine in the treatment of pneumonia, but concluding that this dye "is doubtless not the last word in chemotherapy for this infection." The reports of the use of another dye, sulfathiazole, in pneumococcic pneumonia, indicate that this drug is just as efficacious in the treatment of this infection and has distinct advantages.

According to reports, sulfathiazole is more rapidly absorbed and is more rapidly excreted than sulfapyridine, some 80 per cent of a single dose being excreted by the kidney in twenty-four hours. Its action on the pneumococcus *in vitro* and clinically, seems fully as great as that of sulfapyridine. Its rapid absorption and excretion doubtless account for the greater difficulty in obtaining a high concentration in the blood, but, clinically, a blood concentration of 5 mg. per cent seems sufficient for therapeutic results.

Sulfathiazole, too, is only about half as toxic as sulfapyridine. This is shown by the less frequent appearance of vomiting and malaise which is a distinct drawback to the use of sulfapyridine. Skin eruptions, however, in the form of a maculopapular eruption most prominent over the extremities is paradoxically more frequent with sulfapyridine. An eruption resembling erythema nodosum has been described in a few cases. One author has called attention to the danger of kidney damage from the intratubular recrystallization of the dye in the kidney. This must be of rather rare occurrence with the customary administration of the dye, for hematuria rarely occurs. This possibility, however, offers a warning against large or prolonged dosage and too little liquid in the diet.

The dosage of sulfathiazole is similar to that of sulfapyridine. Two grams can be given as an initial dose, and 1 gram every four hours for twenty-four hours, when the dose should be reduced and then stopped after five to seven days.

So startling have been the results from this use of sulfathiazole in pneumococcic pneumonia that the need for specific serum in conjunction has been cut to a minimum. As a matter of experience the administration of this dye has often interfered with typing and made specific serum administration impossible.

Sulfathiazole has proven itself the outstanding dye in the treatment of staphylococcic infections. Remarkable results in the treatment of staphylococcic septicemia have been reported. It has also proven itself of great value in urinary tract infections in which the staphylococcus Bacillus proteus, alpha hemolytic streptococci and Escherichia coli are present.

It is perhaps useless to warn against expecting the impossible from this valuable dye. Surgical principles should not be lost sight of and nursing and medical care are still important. The occasional occurrence of hematuria and anemia from the use of the dye affords a warning against its careless use.

It would not be too sanguine to predict that further advances in chemotherapy may be expected.

*Minn. Med. 23:124, (Feb.) 1940.

CONTRARY LAWS

Two contrary laws seem to be wrestling with each other nowadays; the one a law of blood and of death ever imagining new means of destruction and forcing nations to be constantly ready for the battlefield—the other, a law of peace, work and health, ever evolving new means of delivering man from the scourges which beset him. The one seeks violent conquests; the other, the relief of humanity. The latter places one human life above any victory; while the former would sacrifice hundreds of thousands of lives to the ambition of one. The law of which we are the instruments seeks, even in the midst of carnage, to cure the sanguinary ills of the law of war; the treatment inspired by our antiseptic methods may preserve thousands of soldiers. Which of these two laws will ultimately prevail, God alone knows. But we may assert that science will have tried, by obeying the law of humanity, to extend the frontiers of life.—LOUIS PASTEUR.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

THE CASE FOR THE DOCTORS

Any honest effort to economize, such as that set in motion in our state government, is applauded by physicians; but it may on occasion overstep the mark and require special adjustments.

Representatives of the Minnesota State Medical Association, while heartily favoring reductions in state expenditures wherever possible, are generally agreed that reductions, in the interest of economy, in the salaries of physicians serving in state institutions would seriously endanger the high standards of medical care always upheld in these institutions. Heads of the institutions, themselves, have become alarmed at reductions proposed last year and have vigorously protested.

Members of other professions have likewise been affected by the reductions and these also have made representations to the authorities. The result was the appointment of a Committee of the Legislature to investigate the situation and make recommendations. Testimony was presented by representatives of the physicians, lawyers, dentists, engineers, laboratory and social welfare workers. The case for the medical profession follows:

Course Is Long

To prepare a physician for practice a longer period of time is required, on the average, than for any other profession. As much or more preliminary college work is required of him before he enters medical school and the medical school course itself is as long or longer than that of any other professional school. A professional degree granted at the end of the course entitles virtually all other professional men to enter immediately upon the practice of their professions; but for the physician an additional year of internship, at the very least, must be fulfilled before he receives his degree and a license to practice medicine. For many men, furthermore, the degree of M.D. is only a stage in their preparation for practice. If the physician wishes to enter upon any specialty—and much of the practice in state institutions is specialized practice—he must have additional training and the minimum time required for such specialized study is almost standardized at the present time at three extra years beyond internship.

It is undoubtedly a fact, therefore, that the medical servants of the state have behind them a longer period of preparation at greater cost than any other group.

Responsibility Is Heavy

No doubt each of the professions could present a strong case for its own relative importance to the work of government but it is also a recognized fact, that, apart from training requirements, none carry with them the responsibility of life and death for the people under their care which the physician carries. Such responsibility weighs heavily on the man who carries it and added to it are irregular hours of work, an irregularity which does not to any great degree affect the other professions. There is also the fact demonstrated in all statistics about physicians that they enter late upon their life work and that it is terminated early. Often it is terminated prematurely by heart disease, that great affliction of physicians, or by early retirement made necessary by the strain and the exacting character of the work. Earnings should therefore, in justice, be adjusted to the length of the earning period.

Money Saved

The advantage to the state of a high quality of medical service is also worthy of careful attention. Aside from the benefit to the individual served there is a saving to the taxpayer that comes from the presence in the institution and

administrative divisions of well-trained men who keep abreast of scientific advancement. Thus the length of illness is reduced, proper regulations for segregation and admittance are maintained and expert advice is available in every phase of public health which in turn leads to reduction of illness and limitation of the institution populations cared for by the state.

In short, it was the opinion of the state association representative that both the public welfare and true economy call for employment of the highest type possible of medical service and that such service cannot be secured without reasonably adequate compensation for the physicians employed. Physicians as tax payers are well aware of the stress and strain of budget making and heartily endorse the desire of the administration to cut costs wherever possible but it was the reasoned opinion of the representative of the state association that both wisdom and economy call for employment in state institutions and departments of the highest type of medical service obtainable.

Pivotal Function

It is obvious, apart from the public interest, that the private welfare of the entire profession is involved in this matter. Standards of compensation for any section of physicians tend to be accepted as standards for all. Furthermore, in virtually all health and welfare programs in the state, whether in the public health units, state institutions or in federal agencies, the doctor is the essential factor. His work is the pivotal function and should be recognized as such even in the matter of remuneration for his work.

PUBLIC HEALTH PROGRAMS INITIATED BY PHYSICIANS

While women's clubs, welfare organizations, congressmen and students were debating health needs of America in terms of costly legislative reforms in 1940, members of the Minnesota State Medical Association were quietly forging ahead in a campaign to see that every child in Minnesota is protected against smallpox and diphtheria. Also they were laying the foundation for what may be an experiment of world-wide significance in the area control of tuberculosis in the human population.

These two projects, conceived and sponsored by the practicing physicians of the state, will cost the state government nothing except the funds already appropriated to the State Board of Health for vaccines and toxoid and, as the tuberculosis project gets under way, for laboratory examinations and treatment already provided in our State Division of Epidemiology and our system of sanatoria for the tuberculous. As they progress, they are certain to save the state untold amounts in money and in the lives of citizens.

The two projects, sponsored and pushed by committees of the Minnesota State Medical Association, were reported in detail at the December Council Meeting of the Association and they afford an apt illustration of what the physician means by a public health program for America, in contrast to the grandiose legislative proposals of non-medical reformers.

Attack Realistic

Both represent a realistic attack upon definite problems, by tested methods, at modest cost and within the existing organization of medical and public health services.

Community vaccination and immunization programs carried on by the physicians who practice in the community are not new in Minnesota. Heretofore, however, they have been carried on in a somewhat sporadic and unorganized fashion. In some counties they have been well organized and have been for some time a routine part of the health services of the community. In others, little consistent effort has been made to reach all of the children and particularly the preschool children in a community effort.

Immunization Campaign Launched

At the direction of the Council last year, and with the coöperation of the State Board of Health, a packet of approved material, including the latest information from authoritative sources on administration of procedures, and also practical information as to aid available from the State Board of Health, three approved plans for carrying on a community program and specimen organization material, such as consent cards and records, were assembled and sent to every medical society secretary and members of all contact committees of the state. Every society was urged to set in motion a medically sponsored plan for its own community if such a plan was not already in active operation.

The result was immediate. Some 35 counties and communities in the state were carrying on

immunization or vaccination programs or both —or were in process of organizing such plans before the end of 1940. More toxoid had been distributed by the Board than in any other year since the state made immunization material available to the physicians of the state and demands for toxoid and vaccine were in danger of exhausting the supply allowed for the purpose in the budget of the Board.

The program under state medical association sponsorship has only just got underway, of course, and further development may be expected during 1941. New impetus will be added, furthermore, by a new and valuable aid just made available through the efforts of the Board in coöperation with the state medical association.

Nursing Aid Available

This new aid takes the form of expert public health nursing service which can be secured to aid physicians in communities where no public health nurse is now employed to carry on the program.

Two nurses have now been made available by the Board for this purpose. Plans for the most effective and economical use of their services are now being drawn up by state medical and health department officials and will be sent direct to county medical society officers within a few days. According to preliminary plans, these nurses will be able to spend a period of approximately two weeks in the community aiding in preliminary organization and possibly in the actual administration of procedures depending upon the local need.

Experiment Started in Tuberculosis Control

The tuberculosis project has a spectacular quality which brought it headlines and front page space in the preliminary public announcement made just before the first of the year.

At the suggestion of the Council the Committee on Tuberculosis has worked out a unique plan for tuberculosis control in the human population of one Minnesota county. This plan is a copy with reservations of the methods used so successfully by veterinarians in eradication of tuberculosis among cattle. Meeker county was chosen for this experiment and if the experiment there is a success, it will be extended to other counties in the state with the ultimate objective of certifying Minnesota for human tuberculosis in much the same fashion as it is now certified for eradication of tuberculosis among cattle.

The success of the veterinarians has for some time constituted a challenge to experts in human tuberculosis. They have felt that here was the key, pending the possible discovery of an effective chemical attack on the disease, to the control of tuberculosis in the human family. But it remained for a committee of physicians to take the first bold experimental step in Minnesota. In getting the experiment under way, the physicians will not go to the legislature and ask for sweeping new authorities and appropriations. In fact, the initial small fund necessary to set administrative machinery at work has already been appropriated by the Council of the association. They will start with a conception new to human tuberculosis control, the area conception of control, and they will work quietly and modestly in one county, first making careful records, using education rather than coercion and, if the time comes when government assistance is needed to put a wider plan into effect, they will be ready with the experience and figures to guide it. This is a typical example of the ideals and methods by which physicians work to conquer disease and improve the health of the people.

Meeker County Chosen

Choice of Meeker county for the experiment is of historical as well as practical interest. It was in Meeker county in 1923 that the first tuberculin testing of cattle on a county-wide basis was undertaken in Minnesota.

Inspired by Dr. Charles E. Cotton, State Veterinarian, who, in 1892, participated in the first tests made on cattle in the United States, the Minnesota Live Stock Sanitary Board entered into a coöperative agreement with Meeker county for compulsory testing of cattle under the area plan in May of that year. A legal battle followed which gained international attention. It was waged and won by Meeker county farmers for the new method. The result was that, in 1925, Meeker county became the first in the world to earn the "Accredited" rating, which means that less than 0.5 per cent of cattle in the county reacted positively to the tuberculin test. By 1935 the entire state of Minnesota had achieved the accredited rating, a remarkable record in disease control.

Meeker county also figured in a pioneer survey

of tuberculosis in the human population carried on there and in four near-by counties by Dr. H. G. Lampson of the State Department of Health in 1912. This survey gave rise to a strong and continuing interest in the tuberculosis problem among physicians of the county and these physicians have now volunteered their services in this new attempt to conquer tuberculosis in Meeker county.

Lay Assistance Sought

Every resident of Meeker county will be offered the tuberculin skin test and all possible means of persuasion will be used to secure widespread acceptance of the invitation. The test will be repeated, systematically followed by careful examination of positive reactors. Assistance of volunteer and lay agencies will be sought to aid in financing x-ray examinations for those who need assistance and in the campaign of education that will be necessary for the success of the plan. Full advice and coöperation will be sought from the State Board of Health.

WISCONSIN EXPERIMENTS ABANDONED: NO DEMAND

It is of interest to students of sickness insurance plans in Minnesota to note that the experiment in voluntary sickness insurance carried on for several years by the Douglas County Medical Society in Superior, Wisconsin, has been discontinued.

Reasons for abandonment are significant: first, that there was an exceedingly small demand for the plan; second, the cost of acquiring subscribers was extremely high; third, the plan did not reach those in the low-income group for which it was designed; fourth, operating costs, which included the new "middle man," were high; fifth, premiums were too small to permit payment of minimum standard fees for the community to the physicians while at the same time paying overhead costs and creating a necessary reserve.

Discontinuance of the trial plan in Milwaukee has also been announced for much the same reasons; likewise, the effort started some time ago to develop a plan in Rock County.

Superior Subscribers Insufficient

The following account of the Superior undertaking and its experience is reprinted from the January issue of the *Wisconsin Medical Journal* because of its importance to all who are interested in new methods for distribution of medical services and especially to those who have reported a great public demand for sickness insurance.

After contribution of over $3,000 in unpaid services by the members of the Douglas County Medical Society, and a contribution, to assist in defraying administration costs, of over $1,100 in cash by the State Medical Society of Wisconsin, the Douglas County Medical Society voted by ballot at its November meeting to discontinue its participation in the experimental voluntary sickness insurance plan of the Coöperative Health Association. The trial plan for prepaid sickness care which assured subscribers to the plan complete and unlimited medical care from their family physician through the payment of monthly dues varying from $1.50 to $2.90 per month had been in service operation for eighteen months. Prior to that time, the Coöperative Health Association had spent a number of months attempting to secure a sufficient number of subscribers (150) to permit initial operation of the plan.

The full-time manager and the executive committee of the Coöperative Health Association, after twenty-four months of intensive sales effort, were able to secure only 295 subscribers to the plan.

The Advisory Committee on Voluntary Sickness Insurance recommended to the House of Delegates that the experimental sickness insurance plans both in Milwaukee and Superior be discontinued at the termination of existing agreements. The House of Delegates, however, following an extended discussion of the plan by the Superior delegate, Dr. T. J. O'Leary, amended the committee's recommendation to provide that continuance or discontinuance of the plan should be governed by the wishes of the local county medical society affected. It is to be remembered that this plan for prepaid medical care is one which was designed by the Coöperative Health Association and subjected to a laboratory trial by the Douglas County Medical Society in order that the members of the local county medical society might assist the profession in Wisconsin in finding, if possible, a plan for the prepayment of medical care which was socially desirable, financially sound, and one which would be possible of enlargement in Wisconsin without incorporating the many inherent dangers invariably found in plans of this type and in the compulsory sickness insurance plans found in European countries. Neither the local county medical society nor the State Medical Society felt, after eighteen months of first-hand study, that this plan held any promise of filling these standards.

The sincerity and coöperation of the Douglas County Medical Society and the State Medical Society were complimented by the Coöperative Health Association through the chairman of its executive committee, Mr. Oscar Cooley, when he wrote to the coöperative societies as follows:

We wish to state also that our relations with the Wisconsin Medical Society and with the twenty-one

doctors on our panel are of the very best. They are giving us their wholehearted coöperation. We regret to have to state this but the fact is that we have received better coöperation from the doctors than we have from the rank and file of consumers.

FOR YOUR PROTECTION

(Monthly Editorial Prepared by the Medical Advisory Committee)

With the ever expanding Defense Program well under way, more and more physicians and surgeons are being called into the Army. There is every indication that within the space of a few months a large number from the State of Minnesota will leave private practice, and enter military service. This means that the practice of the man called into Army service must be turned over to someone else. It may be to one of his associates in his community, or it may be to a Locum Tenens.

If you are called into Army service, and turn your practice over to another physician, certain precautions should be taken for your protection as well as that of the physician who assumes the responsibility of your practice. Have your records up to date, and freely accessible. This includes clinical records, laboratory records, and x-ray records. The physician who takes your place must be able to familiarize himself with the history and findings of the patients whose care he undertakes in your absence. If you leave fractures in the course of healing be very sure that an accurate x-ray record is made of the status of this fracture when you turn over your practice to your temporary successor. If you have cases in the hospital, surgical or medical, be sure that the chart and record in the hospital, as well as your own record in your office, are brought up to date with an accurate description of the patient's condition when you leave the case. Introduce, personally, your temporary successor to all patients who are under active treatment when you leave. Explain to the doctor who relieves you just what you are doing in each case, and just what you think should be done with future treatment. A little time and attention to these details will protect both you and the doctor who relieves you.

In addition to the above, be sure to notify the company who carries your physicians' liability insurance that you are leaving, and inform them who is taking over your practice. If your temporary successor is a young man who has just finished his internship, or fellowship, and who has not had physicians' liability insurance in the past, advise him to get it at once upon assuming your practice. You cannot be too careful about this. While all companies writing physicians' liability insurance issue policies providing for broad coverage, there are many technicalities, and it is of great importance to you and your temporary successor that the insurance company understand what is taking place, and that you and your successor are informed by the insurance company that you are both fully covered.

Your Medical Advisory Committee feels that the year 1941 should see a decline in malpractice suits in Minnesota, and your Committee believes that this will be the case. The Committee realizes, however, that responsibility rests upon the individual physician, and earnestly advises your attention to the details outlined above.

W. H. H.

COUNTY OFFICERS' MEETING

Saturday, February 22, is the date selected for the annual County Officers' Meeting; the place is the Saint Paul Hotel.

This meeting comes at a time when physicians all over the state are pre-occupied with defense problems, either as examiners for the draft, as members of appeal and induction boards, as reserve officers in the medical corps, or as non-eligible civilians upon whom will rest the burden, sometimes under severe handicap, of caring for the cilivian population at home. An important section of program time will therefore be devoted to these special military medical problems with Lt. Col. R. B. Hullsiek, Director, Medical Division of the Selective Service System, and Major F. S. Richardson, Surgeon of the First Military Area, as speakers.

Mr. John B. Pratt of Chicago, executive secretary of the National Physicians Committee for Extension of Medical Service, will be luncheon speaker. He is expected to give emphasis to social and political phases of the defense problem, particularly to the dangers to the traditional American system of practice that may lie in

hasty and ill-considered emergency defense measures.

Another program headliner is Justice Royal B. Stone who will talk to the medical officers about the obligations and responsibilities of the doctor in court and particularly about the work of the newly organized Committee on Medical Testimony to which Minnesota jurists have been invited to send suspicious cases for investigation and possible discipline.

Relief, new state legislation, new state association programs including the immunization program, the subject-of-the-month program and the Meeker county project of the Committee on Tuberculosis will be discussed during the day; also such special secretary's difficulties as securing attendance at meetings.

The conference will open at 8:30 a.m. with round table breakfasts for informal discussion. Expenses will be paid, as usual, for one representative from each county and district society to attend the meeting. All members are invited to be present, however, and all will be guests of the Association at the luncheon at 12:15.

NATIONAL CONFERENCE ON MEDICAL SERVICE

The National Conference on Medical Service, to be held Sunday, February 16, at the Palmer House in Chicago, originated in Minnesota as the Northwest Regional Conference and has grown from a small meeting of medical officials in neighboring states to an important nation-wide gathering. The conference is now held annually in Chicago on the Sunday preceding the Annual Congress on Medical Education and Licensure, scheduled for February 17 and 18. Minnesota speakers on the program are Dr. W. A. O'Brien, director of postgraduate medical education at the University of Minnesota, who will talk about the medical program of the Center for Continuation Study, and Dr. A. W. Adson of Rochester, and Mr. Walter Finke of Saint Paul, director of Minnesota's Division of Social Welfare, both of whom will discuss Minnesota's system for medical care of social security clients.

The program is as follows:

Morning Session

Registration

VOLUNTARY GROUP MEDICAL CARE PROGRAMS

(1) "The Second Year"—Mr. J. D. Laux, *Executive Director, Michigan Medical Service, Detroit, Michigan*
(2) "Why Are We Waiting?"—W. M. Hartman, M. D., *Macomb, Illinois*
(3) "What We Learned From the Wisconsin Experiments"—Mr. J. G. Crownhart, *Madison, Wisconsin*
(4) Question and Answer Period

MEDICAL PREPAREDNESS

(1) Irvin Abell, M. D., *Louisville, Kentucky*
(2) Morris Fishbein, M. D., *Chicago, Illinois*
(3) Colonel Leonard Rowntree, M. D., *Chief, Medical Division, Selective Service System, Washington, D. C.*
(4) Olin West, M. D., *Chicago, Illinois*
(5) Question and Answer Period, conducted by Roy W. Fouts, M. D., *Omaha, Nebraska*

NOON-DAY DINNER

Afternoon Session

President's Address—Forrest L. Loveland, M. D., *Topeka, Kansas*

Report of Nominating Committee; Annual Election of Officers; Selection of place for 1942 Meeting.

STATE MEDICAL SOCIETIES' POSTGRADUATE PROGRAMS

(1) "A Rural State's Program"—H. E. Snyder, M. D., *Winfield, Kansas*
(2) "As Carried On in Minnesota; A Coöperative Program"—W. A. O'Brien, M. D., *University of Minnesota Medical School, Minneapolis, Minnesota*
(3) "The Illinois Program"—Robert S. Berghoff, M. D., *Chicago, Illinois*
(4) Question and Answer Period

LEGISLATIVE PROBLEMS

(1) Federal—E. H. Cary, M. D., *Dallas, Texas*
(2) State—Mr. J. W. Holloway, Jr., *Chicago, Ill.*
(3) Question and Answer Period; Conductor to Be Announced

MEDICAL CARE FOR SOCIAL SECURITY CLIENTS

(1) "Minnesota's Plan for the Care of the Medically Indigent"—Mr. Walter F. Finke, *Director, Minnesota Division of Social Welfare of the Department of Social Security, St. Paul, Minnesota*
Alfred W. Adson, *Chairman, Medical Advisory Committee to the Minnesota Division of Social Welfare, Rochester, Minnesota*
(2) Mr. Walter G. Stumbo, *formerly Attorney for State Department of Social Welfare, Topeka, Kansas*
(3) Chas. H. Phifer, M. D., *Chairman, Illinois State Medical Society Advisory Committee to State Department of Welfare, Old Age Assistance Division, Chicago, Illinois*

"The Annual Meetings From the Standpoint of the Exhibitor"—Mr. C. H. Wantz, *President, Medical Exhibitors' Association, Convention Manager, General Electric X-Ray Corporation, Chicago, Illinois*

In Memoriam

Vincent John Hawkins

Dr. V. J. Hawkins, for fifty-three years a practitioner in Saint Paul, until his retirement in January, 1938, died December 15, 1940, at the age of eighty-five.

Dr. Hawkins was born October 3, 1855, in Conneaut, Ashtabula County, Ohio. He was of Irish descent. At the age of ten, he moved with his parents to Austin, Minnesota, traveling by oxcart and steamboat. This was immediately following the Civil War. His father had served from 1861 to 1865 with the Union Army.

Dr. Hawkins attended the Austin primary public schools and the Blooming Prairie high school. His medical degree was obtained at Rush Medical College, Chicago. The medical training at that time consisted of a 2-year course, but Dr. Hawkins took an extra year, graduating February 22, 1881. His medical diploma carries fourteen signatures, evidently of all his teachers. He also received a "Rush Medical College Certificate in Private Diagnosis" given by Joseph P. Ross, A.M., M.D. as well as a certificate from the Central Free Dispensary of West Chicago for a special course in eye and ear diseases.

Dr. Hawkins first practiced with his uncle, Dr. J. Palmer Johnson, in Blooming Prairie, Minnesota, from where he moved to Saint Paul in 1885. His medical license bears the date February 6, 1884. During his first year in Saint Paul he served on the staff of the City and County Hospital now known as the Ancker Hospital.

Dr. Hawkins' offices were in the Thompson Block at Isobel and South Wabasha Streets for fifty-three years. The outside door to the reception room was never closed or locked day or night. During the early days much of his practice was in the country and many trips by horse and buggy were made over muddy roads to patients in West Saint Paul and as far as the German settlement of Rosemount. Always fond of fine horses he owned five most of the time in the early days. He had some of them trained to gallop in harness by the fireman at a fire station near his house, and even at one time had a gong on his buggy. When he started to drive automobiles in 1910 all this was relegated to the past.

Dr. Hawkins was a general practitioner and performed some surgery. He had about 2,400 successful births to his credit. One of the obstetric cases in which he took great pride was a cesarian section performed September 14, 1889 on a midget seventeen years of age, three feet five inches tall and weighing fifty-eight pounds. Much of his surgery was emergency in character, performed at night in farm houses by the light of a kerosene lamp held outside the window to avoid ether explosion.

Dr. Hawkins was a member of the Ramsey County Medical Society from May 29, 1889 until he became an affiliate in 1928. He was a member of the Saint Paul Board of Library Directors from 1900 until 1905. He was a candidate for the State Senate in 1910. He was one of the first members of the Shekinah Lodge of the Masonic Order and a Past Grand Master of that lodge. He was also a member of the Woodmen of the World and medical examiner of that order for many years. He was a life member of the Riverview Commercial Club and assisted materially in the establishment of the West Side General Hospital. He was an Episcopalian and for many years served on the vestry of the Church of the Ascension as Senior Warden.

Dr. Hawkins had no hobbies but took great pleasure in the practice of medicine and attended medical meetings regularly.

Hugh H. Slocumb

Dr. Hugh H. Slocumb was born in Winona, Minnesota, November 22, 1882. He attended schools at Winona and also Shattuck Military Academy at Faribault, Minnesota.

Dr. Slocumb received his M.D. from the College of Medicine, University of Illinois in 1905, and practiced medicine at Ironwood, Michigan, for several years before moving to Plainview, Minnesota, where he was associated in practice with his brother, Dr. Jess Slocumb.

About 1914 Dr. Slocumb moved to Belgrade, Minnesota, where he enjoyed a good practice until he volunteered his services in 1917 during the World War. He married Hedwig Sund of Belgrade, June 1, 1918, and left the following month for France. Upon his return in 1919 he continued practice in Belgrade until 1929. On account of poor health he moved to California in 1929 and remained there until 1935, when he returned and located at Avon, Minnesota. He remained at Avon until his death, January 7, 1941, which was the result of a stroke suffered three years previous.

Dr. Slocumb is survived by his wife, one son and one daughter.

"For my part I am still unconvinced that the family doctor is an anachronism. I still want somebody to save me from unsuitable or excessive specialist advice; I need someone to coördinate the findings of specialists and discount them if necessary; and above all I want someone who is willing to talk to me, at length, about my migraine, my little boy's delinquencies, my wife's recent strangeness, my baby's inoculation, and my daughter's desire to marry a man with asthma."—LANCET. Copied by the *New York State Jour. of Med.*, (Jan.) 1940.

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Nothing is more important at the present time than to continue and to intensify the campaign against tuberculosis and against syphilis, and I hope that no one will permit his attention to be swayed from the objectives we have in mind, because the fight against these diseases is more important at a time of crisis as a measure of national defense than it is in normal times.—FRANK C. BOUDREAU, M.D.

OF GENERAL INTEREST

Dr. M. J. Anderson is president of the Rochester Figure Skating Club.

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Dr. and Mrs. John R. Paine of Minneapolis spent the holidays at Dr. Paine's home in Dallas, Texas.

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Dr. and Mrs. F. M. McCarten of Stillwater are the parents of a daughter, Mary Ann, born December 15.

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Dr. R. J. Ripple has been elected chief of staff at the Rice Memorial Hospital in Willmar.

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Dr. L. E. Sjostrom of Storden has been named coroner of Cottonwood County.

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Dr. and Mrs. E. James Brady of Minneapolis are the parents of a son, Dennis James, born December 15, 1940.

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Dr. A. Keller Doss, formerly a fellow in the Mayo Foundation at Rochester, is practicing in Fort Worth, Texas. He has offices in the Medical Arts Building.

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At a recent meeting of the American Statistical Association in Chicago, Dr. Joseph Berkson of Rochester was elected a Fellow of the organization.

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Dr. D. W. Pollard of Minneapolis, acting superintendent of General Hospital for the past two years, has been made permanent superintendent of the hospital.

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Dr. W. P. Olson has returned to Gaylord from California to take charge of the practice of his son, Dr. William P. Gaylord, while the latter is engaged in examining National Guardsmen.

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Dr. Stuart W. Harrington of Rochester will deliver the annual Mayo lecture at Northwestern University Medical School, February 10. His subject will be "Diaphragmatic Hernia."

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Dr. Simon D. Brimhall, formerly an associate in experimental surgery and pathology at the Mayo Clinic in Rochester, passed away January 10. Since his retirement in 1922 he had lived in Covert, Michigan.

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Dr. Robert B. Tudor of Saint Paul has become a member of the Adams Hospital staff in Hibbing. He is a graduate of the University of Minnesota Medical School.

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Dr. and Mrs. James H. Haines of Stillwater are grandparents for the second time, a son having been born to their daughter, Mrs. Lloyd A. Nelson of Minneapolis, January 3.

Dr. and Mrs. R. D. Thielen of Saint Michael recently moved into their new home, which also houses Dr. Thielen's offices. The building is of English cottage architecture, with exterior of stucco and stone.

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Dr. W. S. Broker of Wadena is temporarily in charge of the Otter Tail County Sanatorium during the year's absence of Dr. L. J. Webster of Battle Lake, who has been called to active duty in the United States Army.

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Dr. Peter Ward, administrator of Miller Hospital in Saint Paul was reëlected secretary of the Minnesota Hospital Service Association at a recent meeting. James McNee of Duluth is the new president.

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Dr. Albert Fritsche was elected president of the staff at the Union Hospital in New Ulm, January 8. Other officers named are Dr. F. H. Dubbe, vice president; and Dr. C. A. Saffert, secretary.

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Dr. J. L. Bollman of Rochester attended the national convention of Sigma Xi and a meeting of the American Association for the Advancement of Science in Philadelphia last month.

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Dr. Harry A. Palmer of Blackduck married Miss Hulda T. Nyland of Minneapolis, December 21, 1940, in Minneapolis. They are at home in Blackduck, where Dr. Palmer is practicing.

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Carl Drake, son of Dr. and Mrs. Carl B. Drake of Saint Paul, was a member of the Yale hockey team which played against the University of Minnesota six during the holidays.

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Dr. William A. O'Brien, director of postgraduate medical education at the University of Minnesota, addressed a Farm and Home Week session in Saint Paul, January 23.

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Dr. Arthur C. Strachauer of Minneapolis recently returned from a two-weeks' hunting trip at King Ranch, Armstrong-Norias, Texas, where he bagged wild turkeys.

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A grant of $5,000 has been received by the University of Minnesota from the Carnegie Corporation of New York for continued support of investigations of viruses in relation to cell growth, being conducted under the direction of Dr. Robert G. Green.

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Dr. Harry Hall of Minneapolis, orthopedist, has gone to England to be associated with the American Hospital in Britain, of which Dr. Wallace H. Cole of Saint Paul recently became director.

Dr. Charles B. Craft, National Cancer Research Institute Fellow at the University of Minnesota, addressed a women's group in Detroit Lakes, January 24, as the representative of the Minnesota State Medical Association.

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Dr. H. L. Williams was in Boston recently to address members of the New England Otolaryngological Society. He was also in Philadelphia to attend a meeting of the American Laryngological, Rhinological and Otological Society.

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Staff physicians at the Immanuel Hospital in Mankato have elected Dr. William Black as chief of staff; Dr. John A. Butzer, vice president, and Dr. F. W. Franchere of Lake Crystal, secretary. The hospital has purchased a shock-proof, portable x-ray machine.

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Dr. Henry E. Michelson, Dr. Elmer M. Rusten, and Dr. Carl W. Laymon of Minneapolis, and Dr. John F. Madden and Dr. Francis W. Lynch of Saint Paul attended the annual meeting of the Chicago Dermatological Society, January 15.

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Dr. Ruth E. Boynton, director of the Student Health Service at the University of Minnesota, was reëlected president of the American Student Health Service Association at its twenty-first annual meeting in Ann Arbor, Michigan, December 27 and 28.

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Dr. Karl W. Anderson has been named head of the medical department of the Northwestern National Life Insurance Company, Minneapolis, succeeding the late Dr. Henry W. Cook. His appointment was effective as of January 1, 1941.

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Dr. and Mrs. G. W. Clifford of Alexandria have gone to New Orleans where Dr. Clifford will take a six-weeks' postgraduate course in internal medicine at Tulane University Medical School. Dr. O. Braun of Minneapolis is in charge of his practice during his absence.

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Dr. Willard Akins of the More Hospital staff in Eveleth, is the new city health officer in that city. He was appointed to that office January 1 by Mayor Richard C. Floyd who announced a rotation system for this position. He succeeds Dr. W. S. King, who continues as school health officer.

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Dr. William Rademaker of Saint Paul has become associated in practice with Dr. H. W. Arndt in Detroit Lakes. Dr. Rademaker, a graduate of the University of Minnesota Medical School, was formerly with the Minnesota Division of Social Welfare. He will also have an office at Ogema.

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Dr. T. F. Hammermeister was elected president of the staff of the Loretto Hospital in New Ulm at the annual meeting last month. Dr. Albert Fritsche was named vice president and Dr. F. H. Dubbe, secretary.

Dr. H. E. Mortensbak of Hanska read a paper, "Diseases of the Esophagus."

To safeguard patients from influenza, hospitals in Minneapolis last month ordered restrictions on visitors.

At the General Hospital, only the seriously ill were allowed visitors. Similar limitations were in force at the University Hospitals, while private hospitals were barring visitors with coughs or colds.

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Dr. H. H. Kessler of Newark, New Jersey, orthopedist, will be one of the guest speakers at the eighty-eighth annual meeting of the Minnesota State Medical Association, to be held in Saint Paul, May 26, 27 and 28.

Dr. Kessler's subject will be "Rating of Disability."

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Dr. R. A. Beise is the new chief of staff at St. Joseph's Hospital in Brainerd, being named to that position at a recent meeting. He succeeds Dr. J. A. Thabes, Sr.

Other officers named are: Dr. C. E. Carlson, Aitkin, vice chief, and Dr. V. E. Quanstrom, Brainerd, secretary-treasurer.

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Dr. M. S. Henderson of Rochester was in New Orleans last month to attend meetings of the American Academy of Orthopædic Surgeons and the Committee on Fractures and Traumas of the American College of Surgeons. He also participated in giving the examinations of the American Board of Orthopædic Surgery.

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Dr. F. W. Bachnik of the Adams Hospital staff in Hibbing, has gone to Chicago to begin a two-year fellowship in obstetrics and gynecology awarded him by the University of Chicago. He will do his graduate work at Lying-In Hospital operated by the University.

Dr. Bachnik plans to return to Hibbing to practice after completion of his fellowship. His wife and infant son will join him in Chicago in the spring.

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Special courses of instruction in orthopedic nursing are being offered during the winter and spring quarters by the University of Minnesota for a limited group of public health and institutional nurses. The work is being offered with the assistance of the National Infantile Paralysis Foundation, Inc., and in collaboration with the Minnesota Department of Social Welfare, Division of Crippled Children, and the Minneapolis Curative Workshop.

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Dr. Harry Wilmer of Minneapolis, former graduate student at the University of Minnesota who is now interning at Gorgas Hospital, Panama Canal Zone, is winner of the original research prize of Phi Delta Epsilon, national medical fraternity.

Dr. Wilmer was selected for the award at the fraternity's annual convention in Pittsburgh. He worked last year at the university with Dr. Richard E. Scammon. The findings of their research are to be incorporated in a book, "Human Growth and Developmental Anatomy."

Dr. J. S. Lundy of Rochester addressed a recent meeting of the Chicago Society of Anesthetists, and a meeting of the Englewood branch of the Chicago Medical Society. He also attended a meeting of the University of Michigan section of the American Chemical Society in Ann Arbor.

Dr. Walter C. Alvarez of Rochester addressed the Calumet Branch of the Chicago Medical Society, December 20, on "Abdominal Pain."

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Dr. Henry E. Michelson of Minneapolis, director of the Division of Dermatology at the University of Minnesota Medical School, will address two state medical meetings in May.

He has been invited to present a paper at the Nebraska State Medical Association meeting in Lincoln, May 5 to 8, and also at the 1941 annual session of the South Dakota State Medical Association in Mitchell, May 19 and 20. At the latter meeting, he will present a clinic in addition to his paper.

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Funeral services were held at Amery, Wisconsin, January 20, for Dr. John Andrew Regner, eighty-five, one of the last two members of the first class to be graduated from the University of Minnesota Medical School in 1889. Burial was in Lake City, Minnesota. He had practised in Superior, Wisconsin, and in Minneapolis, Wheaton and Cannon Falls, Minnesota.

With the death of Dr. Regner, who retired in 1931, Dr. Charles E. Dutton of Minneapolis is the only surviving member of the class.

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First to hold the Harold Rypins Research assistantship in pediatrics at the University of Minnesota Medical School is Dr. Luigi Luzzatti.

The assistantship was established in honor of the late Dr. Rypins, who was a member of the faculty of the University Medical School for a number of years before going to New York to become secretary of the state board of medical examiners. The assistantship was established by a committee of Twin City physicians, aided by a group of interested and generous persons.

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Dr. Oskar Diethelm of the Payne Whitney Psychiatric Clinic, New York City, and professor of psychiatry at Cornell University Medical College, addressed several meetings in Minneapolis early in January.

He spoke before the Minnesota Mental Hygiene Society on the subject, "The Aging Person"; and before the Minnesota Society of Neurology and Psychiatry on the topic, "A Historic Review of Psychiatric Treatment." He also addressed juniors and seniors in the University of Minnesota Medical School.

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Dr. Martin Aune of Minneapolis has been appointed state surgeon of the Minnesota defense force with the rank of lieutenant colonel, according to an announcement by Col. F. G. Stutz, executive officer of the defense force. Dr. Aune has been assigned to the state staff with headquarters in Saint Paul.

A World War veteran, Dr. Aune served thirty years in the Minnesota National Guard. He retired from the National Guard service two years ago with the rank of major.

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Life and work of interns at the General Hospital in Minneapolis is the subject of an eight-page photographic feature in the January 20 issue of *Life* magazine.

The University of Minnesota Medical School, the article points out, was the first to require internship for an M.D. degree.

Material for the story was obtained last fall when Dorothy Jane Larson, *Life* reporter, and Alfred Eisenstaedt, photographer, came to Minneapolis on the assignment.

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Dr. Dean S. Fleming, Minneapolis epidemiologist, is scheduled to leave soon for England where he will become a staff member of a "siege hospital" being set up for the study of communicable diseases under war-time conditions. The hospital is a joint project of the American Red Cross and Harvard University.

Dr. Fleming, who is taking postgraduate work at Harvard University, is a graduate of the University of Minnesota Medical School. He has been an epidemiologist on the Minnesota State Board of Health.

The hospital to be erected in southwestern England has been prefabricated in the United States. It will be a 126-bed unit, consisting of twenty-two buildings.

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A regional assembly of the Women's Field Army was conducted in Rochester, February 6 and 7, with the State Divisions of Minnesota, Iowa, North Dakota, South Dakota and Wisconsin participating.

Dr. A. W. Adson of Rochester coöperated in planning the program.

Speakers at the assembly dinner held at the Kahler Hotel, February 6, included C. C. Little, managing director of the American Society for the Control of Cancer, Inc., whose subject was "National Defense and Cancer Control," and Dr. W. A. O'Brien of Minneapolis, a director of the national society, and president of the Minnesota Society for the Control of Cancer.

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Guest faculty members for the course in Uterine Bleeding at the Center for Continuation Study on the University of Minnesota campus, February 3 to 5, included George W. Bartelmez, professor of anatomy at the University of Chicago; Dr. Ralph A. Reis, assistant professor of obstetrics and gynecology at the Northwestern University Medical School, Chicago, and Dr. Robert Meyer, formerly director of the pathologic institute of the first women's clinic in Berlin and now associated with the University of Minnesota Medical School.

The course was limited to those with special training in pathology, or obstetrics and gynecology.

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Dr. A. H. Borgerson of Sebeka has purchased the practice of Dr. M. G. Ericsson in Long Prairie and his interest in the Long Prairie Hospital and Clinic. Dr. Borgerson began his association with Drs. M. E.

Mosby and B. L. Gifford in the hospital and clinic, January 1.

Dr. Ericsson has moved to Cedar Falls, Iowa, where he has purchased the practice of a physician who is retiring.

Dr. Borgerson, a graduate of Northwestern University Medical School in Chicago, practiced at Hewitt, Minnesota, before going to Sebeka where he has practiced eight years. During this period he has been a member of the Wesley Hospital staff in Wadena.

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A new degree, Master of Public Health, is to be conferred by the University of Minnesota through the Medical School, as the result of action taken at a recent meeting of the board of regents.

The degree replaces a certificate in public health, which previously has been issued to those completing the work. Candidates for the new degree are required to have prior professional training and a prior professional degree—that is, be graduate physicians, dentists, veterinarians, or graduate nurses who already hold a bachelor degree in public health nursing.

The program of studies leading to the degree will contain not less than forty-five credit hours of professional work in preventive medicine and public health.

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Among Naval Reserve medical officers called to active duty are:

Dr. T. B. Magath of the Mayo Clinic staff in Rochester, assigned to Caribbean area for limited service. He has been stationed in Guantanamo Bay, naval base in Cuba.

Dr. James B. Vail of Henning, lieutenant, assigned to Second Marine Brigade, Fleet Marine Force, Marine Corps Base, San Diego, California.

Dr. W. McK. Craig and Dr. Waltman Walters of Rochester, for limited service.

Dr. H. W. Sybilrud, Bricelyn, who will serve as Lieutenant Commander of the United States Naval Reserve Medical Corps in the Second Marine Brigade. He reported for duty at San Diego, February 4.

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Eighty ophthalmologists and otolaryngologists attended the Course in Ophthalmology at the University of Minnesota Center for Continuation Study, January 20-25. Of the eighty, all except four limit their practice to this field, and half of this group are members of special societies certified by the American Board.

Guest instructors included Dr. Ramon Castroviejo, instructor in ophthalmology at the Columbia University College of Physicians and Surgeons in New York; Dr. Albert D. Ruedemann, head of ophthalmology at Cleveland Clinic in Cleveland, Ohio; Dr. Derrick T. Vail, Jr., professor of ophthalmology at the University of Cincinnati College of Medicine; and Dr. Robert Von Der Heydt, associate professor of ophthalmology at Rush Medical College at the University of Chicago.

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Among guest members of the faculty for the Continuation Course in Hospital Administration conducted January 27-February 1 on the University of Minnesota campus were: Dr. Arthur C. Bachmeyer, director of University of Chicago Clinics; Nellie J. Gorgas, assistant to the director of University of Chicago Clinics; Dr. Malcolm T. MacEachern, associate director of American College of Surgeons; Joseph G. Norby, superintendent of Columbia Hospital in Milwaukee; C. Rufus Rorem, director, Commission on Hospital Service, American Hospital Association, Chicago; and Dr. Stanley J. Seeger, Chief of the Medical Staff of Columbia Hospital in Milwaukee.

A feature of the course was Trustee Day, January 31, when hospital trustees were guests.

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A plaque was presented recently by the Minnesota Hospital Association to the Glenwood Community Hospital at Glenwood, winner of the contest for small hospitals held last May.

The presentation took place at a dinner in Glenwood at which hospitals in Benson, Clarkfield, Montevideo, Morris, Fergus Falls, Starbuck and Willmar as well as the Anoka State Hospital, were represented.

Ray Amberg of Minneapolis, association president, made the presentation. Dr. W. C. Rydburg, chief of staff of the hospital, described the staff organization.

Others who took part in the program included Dr. Walter Gardner, first vice president of the association, and Dr. A. F. Branton, executive secretary.

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Several members of the University of Minnesota Medical Staff have completed motion pictures made by the Visual Education Service of the University of Minnesota.

A two reel, 16 mm. silent, colored film, entitled, "Hemorrhoidectomy; Dissection Method," was completed recently by Dr. Walter A. Fansler of Minneapolis. Pictures were taken by Clayton Wall.

Two movies have been made by Dr. Frank E. Burch of Minneapolis, both 16 mm. silent, colored. One is entitled, "Intracapsular Cataract Operation" and the other, "Extracapsular Cataract Extraction with Peripheral Iridectomy." Photographer for the latter was Lawrence Glesnes.

Robert A. Kissack, Jr., is director of the service and Paul Wendt, production manager.

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The next examination for appointments as commissioned officers in the Medical Department of the Navy will be held at all of the larger naval hospitals and at the Naval Medical Center in Washington, D. C., May 12 to 15, inclusive, it is announced by Rear Admiral Ross T. McIntire, the Surgeon General of the Navy.

Applicants for appointment as Assistant Surgeon, effective about two months from date of examinations, must request authorization to appear for examination before April 21. Applicants must be between the ages of twenty-one and thirty-one years and graduates of Class "A" medical schools. They must have had at least one year of intern training in an accredited hospital.

Additional information may be obtained by addressing the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Physicians who received advanced degrees from the University of Minnesota Medical School at the end of the 1940 fall quarter included: Drs. Wallace A. Merritt, John S. Bagwell, Jr., Alice G. Hildebrand, Lamont R. Schweiger and Donald MacLean Willson, all of Rochester, Masters of Science in Medicine.

Dr. Robert W. Brown of Fort Steilacoom, Washington, Master of Science in Neurology and Psychiatry. Dr. Calvin M. Kershner, Rochester, Master of Science in Ophthalmology. Dr. Henry H. Young, Rochester, Master of Science in Orthopedic Surgery. Dr. George C. Kimmel, Rochester, Master of Science in Pediatrics. Dr. Christopher Robert Dix, Rochester, Master of Science in Plastic Surgery.

Drs. Ercel A. Addington of Spokane, Washington, and John A. L. McCullough, Leo Axel Nash and Everett E. Seedorf, Rochester, Masters of Science in Radiology.

Drs. Morris T. Friedell, William B. Condon, Robert C. Derbyshire, Russell M. Jensen, James M. Leffel, Jr., Karl Chandler Randall, II, Carl P. Schlicke, Wendell S. Sharpe, Francis M. Thigpen, Richard P. Waggoner and Donald H. Wrork of Rochester, and Rochfort W. Kearney of Mankato, Masters of Science in Surgery.

Dr. Samuel Nesbitt of Rochester, Doctor of Philosophy in Medicine. Dr. Charles F. Code, Rochester, Doctor of Philosophy in Physiology.

* * *

Medical Reserve officers called to active duty in the United States Army within the last month include:

Captain Arthur Francis Dworak of Saint Paul, to Fort Bliss, Texas.

Captain Eugene John McCann, Minneapolis, assigned to Fort Snelling.

Dr. Daniel H. Autry, first lieutenant, Rochester; Dr. Francis C. Usher, captain, Rochester; Dr. Alvin John Meyer, captain, Lake City, all assigned to Camp Joseph T. Robinson, Arkansas.

Captain Frank Tracy Cavanor of Minneapolis, Captain Arthur M. Mulligan of Brainerd; First Lieutenants Leo James Conlin of Saint Paul, Harold J. Frank of New Prague, Albert T. Hays of Minneapolis, Morris Cable of Minneapolis, Jerome Scanlan of Saint Paul, Leslie Closson of Minneapolis and Louis Odessky of Saint Paul, all assigned to Carlisle Barracks, Pennsylvania.

Dr. Kinsey MacLeod Simonton, first lieutenant, Rochester; Dr. Carleton Schleuder Strathern, first lieutenant, Saint Peter; Dr. Paul Edgar Swanson, first lieutenant, Virginia; Dr. Alfred Uihlein, first lieutenant, Rochester; and Dr. Louis D. Vaughn, first lieutenant, Rochester, all assigned to Camp Grant, Rockford, Illinois.

Col. William D. Borden, M.C., Fort Snelling, has been transferred to Camp Eustis, Virginia.

Dr. Frederick A. Smith, first lieutenant, Rochester, to Army Medical Center, Washington, D. C.

Boyer's Semi-centennial of Practice*

"To be seventy years young is sometimes far more cheerful and hopeful than to be forty years old."—

Oliver Wendell Holmes on the seventieth birthday of Julia Ward Howe, 1889.

It is not often in our community a physician practices his profession fifty years. Right now we have such a physician—Dr. Samuel Boyer. It is our pleasure, as his professional confrères, to do him honor at this item for his example in devotion to practice, his studiousness, tolerance and understanding. We are proud of a fellow practitioner who can reach his age and carry with him a well digested conception of new discoveries together with the sensible method of applying them. His analytical mind and his understanding of men's motives have helped make him successful in medicine and in politics. It was once said he poised the policies of a certain political party in the palm of his hand.

Doctor Boyer always conducts himself like a gentleman. He is motivated by a kindly spirit which pervades any conversation with him. His kindly smile and an occasional chuckle are in evidence of his keen sense of humor. A joke on himself is as good to him as a joke on others.

Love of the great outdoors has been and still is his pet diversion. In the early days he took long hikes in the woods, sometimes of several days' duration, and the wilderness was a real wilderness then, but he knew how to make himself at home there. The winters were severe and settlements were few and far between. Wild animals were plentiful and fishing was supreme. In town he always prided himself on having the finest of driving horses.

His quiet dignity and his deliberate manner together with his thoroughness and wise judgment give force to the position he may take on any issue. Usually he is very "firmly of the opinion," one way or the other.

His kinship with his son is exemplary and with that in generous measure for all younger men coming up in the profession. He believes in passing on to them as much as possible of the richness of experience of his own generation.

Today, the youngest older man in our beloved profession in Duluth is the man to whom we extend this recognition, Dr. Samuel Huntington Boyer, Sr.

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*The above tribute was read at the annual meeting of the staff of Saint Luke's Hospital, Duluth, Minnesota, held January 16, 1941.

At the same time a letter from the Board of Governors of the hospital was read indicating intention of the Board to place a bronze tablet in the hospital dedicated to Dr. Samuel H. Boyer on which will be inscribed all the names of the chiefs of staff of the hospital.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR FEBRUARY

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis; Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

The program for the month will be as follows:

February 1—Posture and Backache

February 8—Causes of Backache

February 15—Back Injury

February 22—Periodontia

AMERICAN COLLEGE OF SURGEONS TO HOLD SECTIONAL MEETING IN MINNEAPOLIS

March 10, 11 and 12 have been set as the dates for a Sectional Meeting of the American College of Surgeons in which the states of Minnesota, North and South Dakota, Iowa, Nebraska, Montana, Kansas and Wisconsin, and the province of Manitoba will participate. Headquarters will be at the Nicollet Hotel, in Minneapolis.

The sixteen approved hospitals of Minneapolis will provide an excellent clinical background for the College meeting. Many of them will hold operative and non-operative clinics each morning during the meeting, and will also hold demonstrations of hospital procedures for the hospital executives who will attend the Hospital Conference which will also be sponsored by the College during the same three days.

Distinguished surgeons from all parts of the country will address the scientific sessions and lead the conferences and panel discussions. Among them will be the president of the College, Dr. Evarts A. Graham, professor of surgery at Washington University Medical School, St. Louis. At the headquarters hotel there will be educational and scientific exhibits and showing of motion pictures portraying surgical and hospital procedures. A large public meeting on the subject of "Conservation of Health" on the evening of the third day will be the final feature.

The Committee on Local Arrangements consists of Dr. W. A. Hanson, Chairman; Dr. William E. Patterson, Vice Chairman; Dr. Myron O. Henry, Vice Chairman; and Dr. James M. Hayes, Secretary. The chairman of the sub-committee on clinics is Dr. L. Haynes Fowler; on exhibits, Dr. Frederick A. M. Olson; on the Meeting on Health Conservation, Dr. Thomas J. Kinsella; on program, Dr. James A. Johnson; on public relations and speaking assignments, Dr. Martin Nordland; on reception and entertainment, Dr. Theodore H. Sweetser; on speaking equipment and motion pictures, Dr. Arthur F. Bratrud; on transportation and hotels, Dr. H. E. Hoffert; and on ladies' entertainment, Mrs. James A. Johnson.

The medical profession at large, as well as hospital trustees, superintendents, pathologists, dietitians, and other hospital executive personnel, are invited to attend the sessions of the Sectional Meeting and the Hospital Conference, a sufficiently varied program having been arranged to interest members of the several professions which are concerned with service to the sick and injured.

Among the speakers at the evening sessions and the leaders and collaborators in panel discussions will be Dr. Frank E. Adair and Dr. John Scudder of New York City; Dr. I. Mims Gage of New Orleans; Dr. Edwin C. Hamblen of Durham, North Carolina; Dr. C. C. Higgins of Cleveland; Dr. Howard K. Gray of Rochester, Minnesota; Dr. David Cleveland and Dr. Roland S. Cron of Milwaukee; and Dr. Paul B. Magnuson, Dr. Warren H. Cole, Dr. C. B. Puestow, Dr. Michael L. Mason, Dr. Marshall Davison, and Dr. R. W. McNealy of Chicago.

Some of the subjects for panel discussions which have already been selected are, "Evaluation of Disability Following Fractures"; "Blood Transfusion"; "Carcinoma of the Colon and Rectum"; "Chemotherapy in Surgical Infections"; "Choice of Operation for Relief of Vesical Neck Obstruction"; "Complications in Surgery of the Biliary Tract"; "Craniocerebral Injuries"; "Endocrinology in Gynecology"; "Gastric Surgery for Non-cancerous Lesions"; "Hand Injuries"; "Indication for Cesarean Section"; "Proper Choice of Anesthetics with Indications and Contra-Indications"; "Thoracic Surgery"; "Thyroid Surgery"; "Treatment of Hernia by Surgery and by Injection"; "Use of Chemotherapy Before and After Urologic Surgery"; "Varicose Veins"; and "Cancer."

The clinical program will also include a wide range of subjects. Of especial interest will be the cancer clinic and the fracture clinic, and a presentation by the younger surgeons at one of the hospitals of surgical research that is in progress.

Minnesota State Executive Committee,
Waltman Walters, M.D., Rochester
Secretary: James M. Hayes, M.D., Minneapolis
Counselors: William A. Coventry, M.D., Duluth
Harry P. Ritchie, M.D., Saint Paul
Owen H. Wangensteen, M.D., Minneapolis

DR. WHITE TO TALK AT UNIVERSITY

Dr. Paul D. White of the Massachusetts General Hospital, Boston, and the Harvard Medical School, will speak at the University of Minnesota Medical Science Amphitheater, February 28, at 8:15 p. m. His subject will be "Enlargement of the Heart."

Dr. White is also scheduled to give an address at Rochester, February 27.

MINNESOTA PATHOLOGICAL SOCIETY

When the Minnesota Pathological Society meets February 18, Dr. Frank C. Andrus will present a paper, "Gout Nephritis," and Dr. Henry E. Michelson, a paper, "Beck's Sarcoid."

VITAMIN K DISCOVERER TO SPEAK AT UNIVERSITY

Dr. Henrik Dam, associate professor of biochemistry at the University of Copenhagen and discoverer of vitamin K will lecture at the University of Minnesota under the auspices of the Medical School, February 24, at 8 p. m. in Room 15 of the Medical Science Building. His subject will be "Vitamin K—Biochemistry and Clinical Applications."

Dr. Dam will speak at Rochester, February 20.

GEORGE CHASE CHRISTIAN LECTURE

"Present Knowledge of Carcinogenesis," was the title of the lecture presented by Dr. F. Peyton Rous of the Rockefeller Institute for Medical Research, as the tenth annual George Chase Christian Lecture, February 5, at the University of Minnesota Medical School.

At a luncheon round-table on the day of the lecture, Dr. Rous discussed "Latent Neoplastic Changes and Conditional Tumors."

UNIVERSITY OF MINNESOTA INTERDEPARTMENTAL SEMINAR

The program for the Interdepartmental Seminar at the University of Minnesota Medical School to be presented Wednesday, February 26, at 8:00 p.m. in Eustis Amphitheatre, follows:

"The Kinetics of Gas Movement in Respiration with Particular Reference to Helium."—Drs. Robert B. Dean and M. B. Visscher.

"An Analysis of Twenty-seven Cases of Patent Ductus Arteriosus with Physiological Studies"—Dr. Ancel Keys, Laboratory of Physiological Hygiene, and Dr. M. J. Shapiro, Lymanhurst Clinic of the City of Minneapolis.

CLINICAL CONFERENCE OF MID-WESTERN RADIOLOGISTS

The fifth annual clinical conference of Mid-Western Radiologists will be conducted at Rochester, February 14 and 15. Following precedent established by previous conferences, members of the clinical, surgical and laboratory staffs of the Mayo Clinic will present the program. Scientific session will be conducted in Plummer Hall in the Mayo Clinic building.

Official headquarters will be the Kahler Hotel, where an informal banquet will be held Friday evening, February 14.

Dr. B. R. Kirklin of Rochester is local chairman of arrangements.

A special train will be operated between Chicago and Rochester for the conference.

VAN METER PRIZE AWARD

The American Association for the Study of Goiter again offers the Van Meter Prize Award of $300 and two honorable mentions for the best essay submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the Association which will be held at Boston, Massachusetts, May 26, 27, and 28, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double spaced copy sent to the Corresponding Secretary, Dr. W. Blair Mosser, 133 Biddle Street, Kane, Pennsylvania, not later than April 1.

The committee, who will review the manuscripts, is composed of men well qualified to judge the merits of the competing essays. Dr. Brien T. King of Seattle, Washington, received the Award for the year 1940 in recognition of his essay entitled "A New and Function-restoring Operation for Bilateral Abductor Cord Paralysis."

A place will be reserved on the program of the annual meeting for presentation of the Prize Award Essay by the author if it is possible for him to attend. The essay will be published in the annual Proceedings of the Association. This will not prevent its further publication, however, in any journal selected by the author.

BLUE EARTH COUNTY MEDICAL SOCIETY

The Blue Earth County Medical Society, in coöperation with the Blue Earth County Public Health Association, carried on an immunization campaign during the fall months of 1940.

During this period, 2,298 smallpox vaccinations and 1,999 diphtheria immunizations were administered. Rural Blue Earth County, as well as Mankato, was completely covered during the campaign, and an effort was made to give every child in the county the opportunity of this protection.

The Society intends to carry on a Mantoux testing campaign during the early months of 1941.

ST. LOUIS COUNTY MEDICAL SOCIETY

Dr. G. C. MacRae of Duluth was named president-elect of the Saint Louis County Medical Society at the organization's annual meeting last month. He will take office next year.

Dr. A. O. Swenson of Duluth, chosen president-elect last year, assumed the office of president held during the past year by Dr. T. L. Chapman.

Dr. S. H. Boyer, a practicing physician in Duluth for almost fifty years, was honored guest at the meeting.

Other officers named are: Dr. Clarence Jacobson of Chisholm, vice president; Dr. R. P. Buckley, Duluth, secretary-treasurer.

New delegates to the state medical meeting are Drs.

A. N. Collins and L. A. Barney of Duluth. Alternate delegates are Drs. M. H. Tibbetts and Mario Fischer, Duluth.

Delegates elected last year, who will continue to serve are: Drs. G. T. Ayres of Ely, H. E. Binet of Grand Rapids and J. R. Manley of Duluth. Alternate delegates are: Drs. P. G. Boman, C. M. Smith and P. S. Rudie, Duluth.

New committeemen are: Drs. P. G. Bowman and J. R. McNutt, Duluth, and Dr. A. Sinamark, Hibbing, economics; Dr. F. J. Hirschboeck, Duluth, advisory; Drs. Sinamark, W. E. Hatch and W. N. Graves, Duluth, judiciary.

Other committeemen, whose appointments hold over, are: Drs. C. O. Kohlbry and R. J. Moe, Duluth, advisory; Drs. J. K. Kuth, D. L. Tilderquist, E. L. Tuohy and R. S. Forbes of Duluth, O. W. Parker of Ely and Dr. Jacobson, judiciary; Drs. W. D. Coventry, C. H. Schroder, A. G. Athens of Duluth, Dr. Ayres and Dr. R. B. Bray, Biwabik, economics.

GOODHUE COUNTY MEDICAL SOCIETY

Dr. W. W. Liffrig of Goodhue is the newly elected president of the Goodhue County Medical Society. Other officers, chosen at a meeting last month in Red Wing, are: Dr. R. B. Graves of Red Wing, vice president; Dr. J. F. Brusegard, Red Wing, secretary-treasurer.

Dr. R. F. Hedin of Red Wing was chosen delegate to the state meeting of the Minnesota State Medical Association, and Dr. M. W. Smith was named alternate.

WASHINGTON COUNTY MEDICAL SOCIETY

Dr. Alexander McEwan of the staff of the Northern Pacific Hospital in St. Paul was guest speaker at the meeting of the Washington County Medical Society in Stillwater, January 14. He presented a paper on "Arthritis," discussing classification, etiology and treatment.

WOMAN'S AUXILIARY

Mrs. M. A. Nicholson, Duluth, Minnesota, *President*
Mrs. E. V. Goltz, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

Mrs. M. E. Nicholson of Duluth, Minnesota, president of the Auxiliary to the Minnesota State Medical Association, and Mrs. John J. Ryan, president-elect, and historian on the Board of the Auxiliary to the American Medical Association, attended the Board Meeting of the Auxiliary at the Palmer House in Chicago, Illinois, November 29, 1940.

Board members who arrived on Thursday were taken on a tour of the offices of the American Medical Association at 535 North Dearborn Street. This was of great interest to the many women attending.

The Board meeting was called to order at 9 A. M. and was in continuous session until six o'clock. At noon a luncheon was served and Mrs. V. E. Holcombe, national president, introduced the members of the Advisory Council of the Medical Society, Drs. Arthur W. Booth, chairman, James R. Bloss, Ralph A. Fenton, R. L. Sensenich. (Drs. West and William F. Braasch are the other members of the Council but were unable to attend the luncheon.) Dr. Booth read a report of the Advisory Council with their recommendations for the future actions of the Auxiliary. Dr. Nathan Van Etten, president of the American Medical Association, gave a talk that was both humorous and inspiring. Mrs. Holcombe introduced Mrs. Samuel Clark Red, organizer and first president of the Woman's Auxiliary, who gave a very inspiring talk on the growth and possibilities of the Auxiliary. She complimented the states on their great interest and urged them to continue to be a true auxiliary.

Mrs. H. E. Christenberry, circulation manager of the *Bulletin,* reported a mailing list of 1,276. The state reports were given, Mrs. M. E. Nicholson reporting for Minnesota. The Nominating Committee was elected, with Mrs. Ryan as elections chairman. Plans were discussed for the convention of the Auxiliary in Cleveland, Ohio, in June. Mrs. James Blake was president of the national Auxiliary when it met in Cleveland in 1934 and at that time there was no state Auxiliary. Ohio is the latest state to join Auxiliary ranks and Mrs. J. Edwin Purdy the Ohio president was introduced and reported tentative plans for the convention. Mrs. Ryan, as chairman of the special History Committee, recommended that the History, which is being compiled, be printed in 1942 when the Auxiliary will have been in existence twenty years and that the minutes and reports be bound every five years to serve as a future History of the organization. Mrs. M. E. Nicholson will report further matters of interest at the next Board meeting of the State Auxiliary.

Olmsted-Houston-Fillmore-Dodge Counties

The Olmsted-Houston-Fillmore-Dodge Auxiliary held a meeting January 8 in Rochester and Dr. F. M. Feldman, director of District 3, Minnesota Department of Public Health and deputy health officer of Rochester, spoke on the undesirable housing conditions of Rochester. Mrs. T. B. Magath, president, appointed the following chairmen for the entertainment next month when the regional meeting of the Women's Field Army to the Society for the Control of Cancer is held. The committee appointed includes Mrs. B. T. Horton, Mrs. C. W. Rucker, Mrs. L. P. Howell and Mrs. P. S. Hench. The public relations chairman, Mrs. Horton, also spoke at the meeting.

St. Louis County

St. Louis County Auxiliary held its monthly meeting January 14 at the home of the president, Mrs. W. N. Graves, Duluth. After the business meeting the members did Red Cross work. The big project for the St. Louis County Auxiliary this year is the furnishing of the patients' sitting room at the Nopeming Sanatorium.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of November 13, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, November 13, 1940. Dinner was served at 7 o'clock and the meeting was called to order at 8 p.m. by the president, Dr. James Johnson.

There were thirty members present.

Minutes of the October meeting were read and approved as read.

The Secretary read a letter from Dr. L. C. Bacon, of Saint Paul, asking that his name be put on the Senior membership list. A motion was carried that this be accepted.

Dr. William F. Braasch read a memorial to Dr. C. B. Wright, and a motion was carried that it be accepted and spread on the minutes, and a copy sent to the family.

CHARLES BENJAMIN WRIGHT

1876-1940

The members of the Minnesota Academy of Medicine are largely familiar with the wide range of medical endeavor in which our late beloved colleague, Dr. C. B. Wright, participated. They also know of the long list of official positions which he so ably filled. There is no object in enumerating them again. However, these activities alone did not set him apart. It is his other qualities of mind and spirit which made him a physician of unusual attainments, outstanding in his contributions to the economic and scientific progress of American Medicine, and a citizen of exceptional value to society. It is true that he was classified in the medical registry as an internist, since he was a Fellow of the American College of Physicians and a Diplomat of the American Board of Internal Medicine, yet he was interested and well informed in many other phases of medicine. He took a personal interest in the medical and allied problems of many patients who had consulted him over a long period of years and he advised and directed their welfare much like the general practitioner of old. In many respects he represented the ideal practitioner of modern American Medicine.

His interest in the economic and general problems affecting the practice of medicine began with his participation in the affairs of the Hennepin County Medical Society. His intelligent approach to their problems and their solution was appreciated by his colleagues, who gave him official recognition and sought his counsel. His unusual intelligence in this field was recognized by Dr. Herman Johnson, who was not slow to draft him into the service of the Minnesota State Medical Association. A fine friendship arose between these two outstanding men which ended only with the untimely death of Dr. Johnson. Working together they were instrumental in developing medical reforms and in laying plans for the future which gave the Minnesota State Medical Association a predominant position in the legislative affairs of our state and which received national recognition as well.

Valuable as were his services to the State Medical Association, his influence in the solution of national problems involving medicine was even greater. His intelligent appraisal of the various problems confronting American Medicine and his peculiar genius for the solution of such problems soon became apparent to the members of the House of Delegates of the American Medical Association and they elected him to membership on the Board of Trustees. He was not long a member of this powerful body before he was made chairman of its Executive Committee, probably the most responsible position in the entire organization of the American Medical Association. There was no one in the land who had a clearer understanding of the many difficult problems which confronted the medical profession. His keen mind would quickly discern the crux of a problem and any solution which he volunteered was invariably sound and logical. It was generally recognized that he accepted these responsibilities in a most efficient manner. In fact, he devoted so much of his time and effort to the problems of organized medicine that he sacrificed his personal interests. Would that his devotion to the cause of medicine might act as an example to many who gain but do not give.

Those of us who enjoyed his friendship profited greatly. To be in his company was a privilege. His keen analysis of things, his kindly humor, his love of truth and of law and order, were a constant source of inspiration. He will long be remembered as a wise counselor in medical affairs in county, state and nation, as a representative of the ideal in the practice of medicine and for his unselfish endeavors in behalf of his fellow practitioners.

BE IT RESOLVED that a copy of this expression of our love and appreciation be sent to the members of his family with our deep sympathy.

W. F. Braasch

W. H. Condit

Dr. E. M. Hammes read a memorial to Dr. Arthur S. Hamilton, and a motion was carried that it be accepted and spread on the minutes, and a copy sent to the family.

ARTHUR STEPHEN HAMILTON

1872-1940

Dr. Arthur Stephen Hamilton died at his home in Minneapolis on June 2, 1940. He had been severely incapacitated for nearly five years from the residuals of a series of cerebral vascular accidents.

Doctor Hamilton was born at Wyoming, Iowa, November 28, 1872. He graduated from the University of Iowa and then transferred to the University of Penn-

sylvania for his medical training, receiving the M.D. degree from that institution in 1897. His course through the Medical School represented a period of considerable hardship due to financial stringency which imposed a limited diet upon him and necessitated extracurricular work to supplement his meager funds. The stimulation which he received as a student of Mills and Spiller was undoubtedly a potent factor in the choice of neurology and psychiatry as his specialty.

After receiving his medical degree, Hamilton became an assistant physician at the Independence State Hospital in Iowa and held that position until 1904. At Independence he became greatly interested in neuropathology and published numerous papers on the pathology of conditions which at that time had received very little attention from microscopists. At Independence he was associated with two other physicians who also were destined to advance our knowledge of neurology and psychiatry, Dr. Albert H. Barrott and Dr. Adolf Meyer. While at Independence he married Dr. Susanna P. Boyle, who was also a member of the State Hospital staff; there are no children of their union.

In 1904 Dr. Hamilton moved to Minneapolis, Minnesota, entering the practice of neurology and psychiatry, receiving an appointment as instructor in neuropathology at the University of Minnesota. He advanced through the academic ranks to a full professorship which he received in 1916. In 1912 he was made Director of the Division of Nervous and Mental Diseases and was Professor and Director until the onset of his terminal illness in 1935. Two extended study trips abroad gave him familiarity with clinical methods of Germany and England, especially the latter; these he applied in his practice and emphasized in his teaching.

Doctor Hamilton was elected to membership in the Minnesota Academy of Medicine and read his inaugural thesis on January 5, 1910, entitled "Paretic Conditions in the Aged." He served as its president from September, 1923, to September, 1924, and his presidential address was entitled, "Historical Survey of the Minnesota Academy of Medicine."

Doctor Hamilton served in 1918 and 1919 as Captain and Major in the U. S. Army during the World War.

Doctor Hamilton was considered by his students to be an unusually systematic and lucid teacher both in the lecture room and at the bedside. His breadth of knowledge, clear analytical thinking, careful technic, gentleness with patients and consideration for the younger colleagues' opinion constituted in him the nearly ideal combination for an advisor and preceptor of the more advanced students.

Though rather reserved and dignified, he was never austere or supercilious, but was approachable, friendly, and rarely ruffled. His appreciation of the social implications of neurology and psychiatry drew him into active participation in civic affairs so that he was frequently consulted on matters involving the welfare of the community and the state. Preferring the pursuits of practice, teaching and investigation he nevertheless was an active participant in numerous national and local societies; he was a past president of the Central Neuropsychiatric Association and former chairman of the Section on Nervous and Mental Diseases of the American Medical Association.

Minnesota and its environs have benefited from the presence of Arthur Hamilton. His many friends grieve over his passing.

J. C. McKinley, M.D.
E. M. Hammes, M.D.

Upon ballot, the following men were elected as candidates to Active membership in the Academy:

Max W. Alberts.....Saint Paul
Erling W. Hansen.....Minneapolis
Donald McCarthy.....Minneapolis
Archie H. Cardle.....Minneapolis
William Sadler.....Minneapolis

The scientific program followed.

HYPERTENSION AND SURGICAL DISEASE OF THE KIDNEY

William F. Braasch, M.D.
Rochester, Minnesota

Dr. Braasch read a paper on the above subject and showed several lantern slides.

Discussion

Dr. Arnold Schwyzer, Saint Paul: We surely want to thank Dr. Braasch for bringing this subject before our Society. It is a very valuable paper especially for the surgeon, inasmuch as, even in the presence of considerable hypertension, we can go ahead and operate with more assurance and an easier mind if an operation on the kidney appears imperative. Such a study, to be impressive and of real value, must be done on a very large amount of material which, of course, Dr. Braasch had at his command.

Dr. H. B. Zimmermann, Saint Paul: It would be interesting if Dr. Braasch would compare the statistics in this paper with another series of major surgical procedures done on individuals with high blood pressure but with no thought of reducing the blood pressure. I have seen a great many cases, for instance, of women with hypertension who were relieved for long periods of time following a hysterectomy for fibroid tumors.

About two years ago I did a major amputation on a man in his early forties for a peripheral vascular disease. He had a severe hypertention. Since his amputation, his pressure rarely goes over 140.

One of the best results I have ever had from a supradiaphragmatic splanchnic resection was in an individual where I had to abandon the operation before I had finished.

There is something mysterious about hypertension, and I am personally convinced that a major surgical procedure often does something to change these patients' mode of life in such a way as to favorably influence the hypertension.

Dr. John F. Noble, Saint Paul: We have had some opportunity to watch the response of hypertension to the removal of a diseased kidney and our clinical impression has hardly been favorable. One case in particular comes to mind. The patient was a girl in her teens who was suffering from severe hypertension which was at first thought to be essential in nature. After urologic examination, it was decided that the pyelogram on one side suggested a picture of pyelonephritis with contraction of the kidney. This was somewhat supported by the clinical history. In spite

of the fact that the preponderance of the clinical opinion favored the diagnosis of essential hypertension, the small kidney was removed. The histologic picture was that of an arteriosclerosis of the kidney with some evidence of a chronic pyelonephritis. There was a distinct reduction of blood pressure after the nephrectomy for a period of six to eight months, with corresponding clinical improvement. The hypertension recurred, however, and the patient went on to death in a period of less than two years due to a renal insufficiency on an arteriolosclerotic basis. I believe the temporary decrease in blood pressure was simply secondary to the surgical operation.

Long periods of freedom from hypertension have been reported, as pointed out by Dr. Zimmermann, to follow major surgical procedures entirely unrelated to the kidney. Our experience has been very limited, but we have been frankly skeptical of many of the reported cures of hypertension following nephrectomy. One cannot question the brilliance and importance of Goldblatt's work, but it is questionable whether his experimental material can be directly applied to the problem of human essential hypertension.

TUMORS SIMULATING CARCINOMA—HAND-SCHÜLLER-CHRISTIAN'S DISEASE

William A. Hanson, M.D.

Minneapolis, Minnesota

These tumors which have been reported increasingly since they were first reported by Rayer in 1836, Hand in 1893, Schüller in 1916 and Christian in 1919 are of interest in all fields of medicine and dentistry. So intimately is this clinical entity related to xanthomatosis and the reticulo-endothelial system that a sharp line of demarcation cannot be established, and therefore these two will necessarily be included in the discussion. The importance of the reticulo-endothelial system may be ascertained in a textbook of hematology.

Hand-Schüller-Christian's disease is undoubtedly due to a disturbance of the cholesterol metabolism,[7] which view, however, is not completely accepted by the morbid anatomists who emphasize the primary inflammatory nature of the disease.[3] Some investigators believe a filterable virus may be a factor.[1]

Probably the greatest contribution and understanding of the disease was brought forth by Rowland in 1928.[7] He concluded that these tumors infiltrate the reticulo-endothelial system resulting from an infiltration of lipoids in excess in the body fluids and are an expression of the body's attempt to rid the body fluids of lipoids which cannot be properly excreted and therefore act as an irritant. The various lipoids, cholesterol, fatty acid esters, phosphatid lipoids, probably lipoid proteins, are concerned with the process, but the anisotropic esters of cholesterol have been most often observed and studied.[7]

Henschen[6] recognized seven clinical groups.

1. Cases with skeletal transformations, exophthalmos and diabetes insipidus (complete triad).
2. Cases with skeletal transformations and exophthalmos but without diabetes insipidus (incomplete triad A).
3. Cases with skeletal transformations and diabetes insipidus but without exophthalmos (incomplete triad B).
4. Cases with skeletal transformations but without exophthalmos and diabetes insipidus.
5. Cases with diabetes insipidus but without skeletal transformations.
6. Cases with disturbances of growth.
7. Cases of so-called xantho-sarcomatosis without skeletal transformations and without diabetes insipidus.

Etiology.—Probably hypercholesterinemia is the most fundamental cause of these xanthomatous lesions; however, such factors as trauma, inflammation and infection cannot be disregarded.[7]

The majority of the cases have been observed in children and relatively few after puberty or in middle or advanced age. The male sex is more often affected than the female. There is no race predilection or familial occurrence. It usually occurs as nodular discrete lesions in the slowly evolving adult forms and as a more diffuse process in the rapidly developing infantile cases. Apparently diet is not much of a factor although it may influence the condition in some cases where it has already manifested itself.

Pathology.—Hand-Schüller-Christian's disease may be regarded as a chronic disease. In this disease the lipoid containing lesions have a predilection for the dense connective tissue adjacent to the bones, especially the skull, and by pressure cause defects in the bones with sharp edges. They develop from the dura mater, periosteum and endosteum, filling the defects of the bone which they produce. They may also originate from the articular ligaments and protrude into the joint space.[3] They may be found in many different organs and tissues such as skin, mucous membrane, gums, palate, ribs, liver, spleen, spine, bones, tendons, peritendons, periarticular surfaces, etc. The spleen and liver may or may not be enlarged, and if enlarged they never reach the size which is observed in Gaucher's and Niemann-Pick's disease.[3] In the former in the parenchyma of the liver and spleen there are either no specific lesions or only small ones without diffuse general involvement.

The accumulation of cells filled with cholesterol esters has been observed also in many organs and structures and may be very minute or macroscopic in character.

The outstanding clinical features, diabetes insipidus and the exophthalmos, are the results of changes in the skull. In the cases with pulmonary fibrosis there may be respiratory difficulties with cyanosis and hypertrophy of the right heart.[3]

The lesions are variable in size and form with an abundance of protoplasm and dark staining nuclei, while in the fresh state the cells are sometimes loaded with fat droplets.[1] If the fat is dissolved out, the protoplasm becomes a fine areolar network with foamy or vacuolated appearance, therefore the foam cell. Due to the presence of giant cells, fibrocytes, eosinophilic leukocytes and round cells they have been considered inflammatory granulomas. These granulomas which

involve the bone may reach considerable size and be mistaken for a tumor. In contrast to real neoplasms, they do not correspond with hematogenous metastasis in their distribution and their lack of infiltrative and destructive character by avoiding vital tissues.[7] Also the xanthomatous nodule does not increase by multiplication of its cell element but by the addition of new cells. If considered from their relationship to the reticulo-endothelial system, they may be summed up from the following phenomena.[7] The constant presence of excess lipoid in the blood stream causes an irritation of the vessel walls; thus a perivascular infiltration takes place. At first, small round lymphocytes with little protoplasm appear; then by splitting of the vessel walls, a fusiform cell with an abundance of protoplasm develops, and owing to a fusion multinuclear xanthoma cells are formed. These cells all contain lipoid with a greater amount in the more mature cells. These cells may vary in size and form, but their nuclear structure is similar. They never show karyokinesis. The young cells are always in the center of the lesion near the blood vessel, and the older and more mature cells are at the periphery. The characteristic cells are not always observable in the lesions, and they may retrogress or recur after excision (Rowland). The lesions tend toward fibrotic involution, and in the process there is a resulting arrangement of wavy bands and whorls.[3] In the bones the defects are filled by dense connective tissue in which bone is formed by metaplasia, and the continuity of the bone may be restored.[3] Some cases resemble cystic osteofibrosis (Chiari). The lungs in some cases show fibrotic induration with a honey-combed appearance. Viet reports a case with a diffuse sclerosis of the glands of internal secretion. The xanthomatas may also undergo necrosis and calcification. Therefore with this varied pathology considerable difficulty may be encountered in making the diagnosis.

Symptoms.—The onset of the disease is insidious and periodic; it is usually far advanced before a physician is consulted. In children there has been a history of measles, scarlet fever, etc. Trauma probably plays a part. One of the earliest findings in children is an ulcerative gingivitis with loosening of the teeth, due to the destruction of the alveolar process of the jaw by the xanthomatous tissue.[7] The symptoms depend on the location of the disease, the extent of the lesions and the mechanical effects resulting from the pressure and bone destruction. Subjective symptoms may be slight, or there may be irritability, often tenderness and pain referred to the lesions which may be severe in the rapidly progressive cases.[3] Polyuria and polydipsia and protrusion of one or both eyes are the most outstanding symptoms.

The head may be deformed by soft subcutaneous swellings, or the defects may be felt in the skull. There may be deafness due to middle ear involvement. The triad of symptoms, defects of membranous bones, exophthalmos and diabetes, are due to xanthoma-like lesions in the skull. The lesions of the dura mater and the periosteum erode the bone and produce the defects. They affect the hypophysis, infundibulum and base of the brain and therefore lead to diabetes insipidus. They break into the orbits and produce a protrusion of the eyeballs. The exophthalmos may be extreme with or without optic nerve injury or choked disc. About 85 per cent of the cases have exophthalmos and diabetes insipidus. Arrest in growth is associated with diabetes insipidus, and in children anemia and cachexia are noted. In some cases there may be an unexplained fever. The skin may be a light yellow or brownish color. The lesions have been found in the face, upper half of the body and in the region of the buttocks in one-third of the cases. These yellowish nodules may appear and disappear. Children in the later stages develop respiratory difficulties due to the fibrosis of the lungs, and the x-ray findings may resemble a miliary metastasis. Due to the induration in the pulmonic fields, there is an increase of the resistance in the circulation with right cardiac hypertrophy and accentuation of the second pulmonic tone.[3]

Prognosis.—The progress of the disease is slow and irregular with intervals of improvement. The milder cases take a prolonged course. Death often occurs between the second and fourth years of life as a result of respiratory complications, cardiac insufficiency or severe anemia.[3] According to Rowland children in the sixth and seventh years suddenly become obese and exhibit the typical picture of dystrophia adiposogenitalia. The mild cases may extend to middle life, and in older individuals the findings may be accidental. The mortality is about 30 per cent in adults[10] which is more favorable than carcinoma, and several individuals have survived one and two decades with and without treatment.[5]

Laboratory Findings.—The daily amount of urine in the presence of diabetes insipidus various from four to fifteen liters, of low specific gravity, 1.001 to 1.004. Occasionally transient[1] glycosuria with low sugar tolerance is noted, but no albumen.[3]

The blood during the progressive stage of the disease may show a moderate to marked increase of the cholesterol content which may be as high as 397 mgm. per 100 c.c. of blood. Hoefer states that the total fatty acids are above normal. During remissions the lipoid content is within normal limits.[3]

In the severe cases the red blood cells may be below 1,000,000, while in the milder cases a moderate hypochromic anemia with a red blood count of 3,500,000 to 4,500,000 per cubic millimeter and a hemoglobin content of 55 per cent may be present. The while blood cells vary between 7,000 and 2,300 per cubic millimeter, while at times there may be an increase in the eosinophiles and monocytes.[3]

X-rays of the skull reveal sharply defined, irregularly shaped defects of the bones with geographical outlines and without reactive bone formations.[1] All parts of the skull may be involved. According to Christian the skull looks like a moth-eaten piece of cloth.[2] Other bones may also be involved.

Diagnosis.—1. One should be mindful of the disease if there are bony defects, especially in the cranial bones, polyuria, polydipsia, exophthalmos, loosening of the teeth, dwarfism and dystrophia adiposogenitalia.

2. Bone defects, especially of the cranium, which are sharply delimited with a map-like appearance, are probably the most important characteristics of the entity.

3. The large foam cells with abundance of protoplasm and small dark nuclei are generally characteristic of the disease.[1]

Therapy.—Dietary treatment may be mentioned such as a diet consisting chiefly of carbohydrates, with moderate amounts of proteins and very little fats.

The diabetes insipidus may be influenced favorably by pituitrin medication and insulin. Thyroid extract has been used without much effect and Sosman reports that some cases have shown improvement by healing of the defects of the bone from x-ray therapy.[8] Thus we have no specific or definite therapy.

Case Report

Mrs. H. L. G., white and fifty years of age, was seen by us August 12, 1926. She was referred on account of a tumor of the right breast which was discovered on examination. She had also complained of insomnia and at time diplopia, associated with dizziness, of six weeks' duration; generalized headaches at intervals with a "whistling" sensation in the ears, for the same period of time; dull pain over the precordium at times, not related to exercise, and of variable duration. A rather marked complaint was a low backache of varying degree with difficulty in stooping and standing. The backache had been present since childhood, increasing in recent years. She had difficulty turning in bed and also was uncomfortable lying in bed. Over-exercise aggravated her backache and produced difficulty in standing erect. She had a sensation in the top of her head which she described as loose bodies, especially when stooping or leaning over. Associated with this was a dull bizarre pain over the top of the cranium.

Family History.—The mother had died from carcinoma of the uterus. Two maternal aunts also had died of carcinoma of the uterus.

Past History.—The patient is said to have had sleeping sickness as a child. She also had scarlet fever as a child without complications, and influenza said to have been complicated by peritonitis.

She had had a hysterectomy and appendectomy in 1919, and a hemorrhoidectomy in 1920. Her history otherwise was essentially negative.

Physical Examination.—The patient measured five feet eight inches in height and weighed 185 pounds. The temperature was 98.6 F., pulse 84, and the blood pressure registered 165 systolic and 110 diastolic in mm. of mercury. Her skin was dry and scaly. Tenderness was elicited in the right subcostal area but no masses were felt. A small firm mass was noted in the upper outer quadrant of the right breast. The pelvis showed no masses, and there were a few external hemorrhoids on rectal examination. There was noted tenderness on palpation over the right sacro-iliac joint with apparently normal motions of the spine.

Laboratory Examination.—The urine was normal on several occasions. The hemoglobin was 75 per cent, with 5,248,000 red blood cells per cubic mm., and the white blood cells numbered 8,000 and 9,300 per cubic mm. with a normal differential count.

X-ray studies of the lumbar spine and pelvis revealed destruction of the intervertebral disc between the 4th and 5th lumbar bodies. The left sacro-iliac joint showed a pronounced increased density with an abundance of striations present believed to be an osteoblastic metastatic carcinoma. There were noted small sharply circumscribed areas of rarefraction which were also interpreted as metastatic carcinomas of the frontal and parietal areas of the skull.

The mass in the right breast was removed under gas anesthesia without difficulty and was fairly well encapsulated. No further exploration was deemed advisable. She made an uneventful convalescence. The mass grossly was rather firm and of uniform consistency. On microscopic sections the interpretation was metastatic carcinoma probably hypernephroma, and Grade IV carcinoma of the adeno type, primary undetermined.

In August, 1930, she was again seen for reëxamination, with the same findings as before, but now she also had some tenderness in the jaw. The pelvis, on x-ray examination, showed the process to have extended into the acetabulum, and the skull showed the defects to be smaller.

In May, 1932, when seen again, she had gained eight pounds in weight, and her blood pressure was 180 systolic and 110 diastolic; the pulse was 100 per minute. The right pupil was larger than the left. She complained of tenderness and pain over the right sacro-iliac joint radiating to the right lower quadrant of the abdomen, increased by activity. The spine on x-ray showed no appreciable change. One year later she informed us she had had attacks of an unexplained intermittent fever, as high as 103 F.

In July 1934, her condition and findings were similar to the previous examinations. Inasmuch as there was no change, a review of the sections was undertaken, and the masses of foam cells were discovered. The paraffin block was again sectioned and studied, the portion examined containing the characteristic foam cells. The interpretation of the skull and lumbar spine was Paget's disease. The blood cholesterol was 167 mgms. per 100 c.c.

On July 11, 1939, her examining physician informed us her condition was as follows: the attacks of dizziness were infrequent but very severe, came on suddenly and persisted for two to three days. To obtain relief she found it necessary to lie on the right side with her eyes closed, wearing dark glasses and having the shades drawn. Associated with the above, was considerable nausea. She would see four or five objects, and the room would go around and around. She had no deafness or tinnitus. During these attacks she could not turn to the left without increasing her complaints. Headaches over the entire skull had been observed also during the past year.

Physical examination revealed a blood pressure of 175 systolic and 100 diastolic, she had had a recent operation on the left breast, but the pathology was not known. The eyes, nose, throat, chest, heart and abdomen appeared normal. The examination of the ears revealed no definite disease. X-rays made of the mastoid, petrous bone, skull, lumbar spine, pelvis and femur were interpreted as Paget's disease.

Summary.—A general consideration of Hand-Schüller-Christian's disease has been reviewed with a presentation of a case with lymph node involvement which has been under observation for fifteen years without much change, and which had previously been diagnosed as carcinoma and Paget's disease. The flat bones of the skull, the lumbar spine and ilia showed involvement. The etiology of the disease is not definitely known nor is the treatment. This again emphasizes the importance of biopsy and the review microscopically of the tissues removed at operation.

Acknowledgment is made to Dr. E. T. Bell, of the

Department of Pathology, University of Minnesota, and to Dr. Norman Johnson, for their coöperation and aid in this case.

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Discussion

Dr. S. E. Sweitzer, Minneapolis: If the surgeons do not care to talk about this, I have a word to say about this patient of Dr. Hanson. These cases are interesting to the surgeon, the ophthalmologist, the internist, and the dermatologist. It shows the difficulty of making a diagnosis from the slides. The condition is closely allied to reticulo-endotheliosis, and Drs. Winer, Cummings and I wrote up a case two or three years ago. We did a biopsy and found the first slide looked like xanthomatosis, and later slides showed reticulo-endotheliosis. There was no involvement of the bones of the skull, and no diabetes. The child kept getting worse and finally died. Autopsy showed reticulo-endotheliosis of the pelvic bones and of the spine. Sections showed reticulo-endotheliosis in some places and other sections showed Hand-Schüller-Christian's disease as shown tonight.

There is something to remember about this condition —that is, we do not know much about it. It is closely allied to endotheliosis and we don't know much about that either. The only thing we can do is, when we find a case, to report it and study it. Both Hand-Schüller-Christian's disease and reticulo-endotheliosis may be phases of the same fundamental disease and have the same background.

Dr. Hanson: I should like to have Dr. Sweitzer's opinion regarding the disturbances of the reticulo-endothelial system with patients who manifest the yellowish xanthoma plaques of the skin; in other words, do they manifest general xanthomatous manifestations?

Dr. Sweitzer: I have seen hundreds and hundreds of those yellowish plaques under the eyes, and not one of they had any of these other conditions.

* * *

The meeting adjourned.

A. G. Schulze, M.D., *Secretary.*

Tuberculosis mortality acts something like a social barometer, rising during wars, and rising highest in the countries most affected by the war. It is difficult to prophesy what the present war will mean in increased tuberculosis mortality in the belligerent countries, but we may be sure that it will be once more a true barometer of disturbed social conditions. Countries which are making the greatest efforts, which are keeping their industries keyed up to the highest pitch, working their men the longest hours and reducing standards of living to the lowest levels are bound to suffer severely.—Frank C. Boudreau, M.D., *News Digest of the Milbank Memorial Fund,* (June) 1940.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

It is your life—Keep Healthy, Stay Young, Live Long. Max M. Rosenberg, M.D. Formerly in charge of Clinical Laboratory O. P. Department, Beth Israel Hospital, Clinical Assistant Internal Medicine, Beth Israel Hospital, Clinical Assistant Pediatrics, Gouverneur Hospital. 450 pages. Illus. Price, $2.50, cloth. New York: The Scholastic Press, 1940.

The endocrine function of iodine. William Thomas Salter, Assistant Professor of Medicine, Harvard Medical School, Associated Physician Thorndike Memorial Laboratory, Boston City Hospital. 351 pages. Illus. Price, $3.50, cloth. Cambridge, Mass.: Harvard University Press, 1940.

The 1940 year book of general medicine. Edited by George F. Dick, M.D., J. Burns Amberson, Jr., M.D., George R. Minot, M.D., S.D., F.R.C.P., Edinburgh and London, William B. Castle, M.D., A.M., M.D., (Hon.) Utrecht, William D. Stroud, M.D., and George B. Eusterman, M.D. 934 pages. Illus. Price, $3.00, cloth. Chicago: Year Book Publishers, 1940.

Clinical Pellagra. Seale Harris, M.D., Professor Emeritus of Medicine, University of Alabama, Birmingham; assisted by Seale Harris, Jr., M.D., formerly Assistant Professor of Medicine, Vanderbilt University, Birmingham; foreword by E. V. McCollum, Ph.D., Sc.D., LL.D., Professor of Biochemistry, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md. 494 pages. Illus. Price, $7.00, cloth. St. Louis: C. V. Mosby Co., 1941.

Strange Malady—The Story of Allergy. Warren T. Vaughan, M.D. 268 pages. Illus. Price, $3.00, cloth. New York: Doubleday, Doran & Co., 1941.

HUGH YOUNG; A SURGEON'S AUTOBIOGRAPHY. 554 pages. With over 100 drawings by William P. Didusch, and three color prints. Price $5.00, cloth. New York: Harcourt, Brace and Company, 1940.

Some ten years ago the author dictated for his children a brief story of his experiences as a boy on a Texas ranch, and also told them of those fighting men, their grandfathers. He states that after this purely personal document happened to come to the notice of Mr. and Mrs. Harcourt they gave him no rest thereafter until he began to write this autobiography. Then the question arose as to how much of his work as a urologist, on which he had spent most of his time and effort, should be included. His friends, as well as his publishers, advised him to tell the whole story; without it, important as it was, the picture would be incomplete and therefore untrue. Besides this, he argued, his work had been largely with afflictions about which

there was still much ignorance, among them some of the deadliest of diseases. Subjects that were once taboo are now freely discussed by the laity, so now was an opportunity to shed some useful light on them, which he decided to utilize. Chapter 6, 128 pages in length, captioned "Developing a Specialty," is devoted to this phase of his interesting career and is beautifully illustrated by drawings from the hand of William P. Didusch, the artist who has been responsible for the illustrations in the technical publications of the author over a period of years. This section of the book alone makes it unique among medical autobiographies.

The preceding chapters deal with the author's ancestry and childhood, his student years and those of starting to practice in Baltimore. A graduate of the University of Virginia he took some graduate work in Johns Hopkins and then secured an internship followed by a surgical residency in the Johns Hopkins Hospital. This was in the heyday of the Big Four, with whom he was thrown in close contact and his association with these well-known men affords him an opportunity to tell some delightful stories and give an intimate insight into their personalities. Osler and Halsted both had a keen sense of humor and were practical jokers. Perhaps this had its influence on the author, for the book teems with wit and light heartedness throughout. His earlier days were not easy, but he came of fighting stock and writes of his difficulties as easily and unconcernedly as with the restraint he applies to his successes.

His later years were full of action and interest. Happy in heart and in his daily life he never allowed himself to be enslaved by the problems or the demands of his professional work but gave freely of his time, thought and means to outside activities. He travelled, hunted and fished, learned languages, patronized art and music and through his professional contacts with people important in political life was able to influence the passage of public health measures in fields far removed from his own specialty. He was an early enthusiast in aviation.

With the outbreak of the World War and as it progressed he became increasingly incensed at Germany and felt strongly that we should prepare for war. He wrote articles on the necessity of military training in the *New York Times* and the *Baltimore Sun* during the winter of 1916-17 but saw no results, so he joined with a small group of professional and business men from Baltimore to present the matter in person to President Wilson, who listened to them without evidence of more than casual interest. Soon after our entry into the war the author went to Washington again and offered his services to the Surgeon General, who issued orders for him and three assistants to proceed to England at the earliest possible moment for special urological duty. How he complied with these orders constitutes one of the most amusing stories in the whole book. But this assignment led to the most far-reaching consequences imaginable: the institution of thorough-going measures for the prevention of venereal disease throughout the A.E.F.

At seventy Hugh Young can look back on a long life fraught with joy and usefulness. He concludes his delightful recital with these words: "Need I say more to show how much I have enjoyed the life I have led, or what a thrilling time I have had in my professional work? But there is still so much to do, so much to live for."

GILBERT COTTAM

A SURGEON'S LIFE; THE AUTOBIOGRAPHY OF J. M. T. FINNEY. J. M. T. Finney. 396 pages. Price, $3.15, cloth. New York: G. P. Putnam's Sons, 1940.

You will read every word, spellbound. You will not want any interruption when you read this book. Refreshingly stimulating and encouraging—just what you long for now—a personified human touch. A life with a goodly heritage. A race well won! Honors well deserved! Truly the author's lot has fallen in pleasant pastures.

Physicians, medical students, nurses, social workers, patients will want to read this book. The reviewer also whole-heartedly recommends its careful study and application by each member of the present-day medical schools' faculty admission committee members. This autobiography is a light unto the feet of him who aspires to make medicine his vocation.

LILLIAN L. NYE, M.D.

DO YOU WANT TO BECOME A DOCTOR? Morris Fishbein, M.D. 176 pages. Price $1.50. New York: Frederick A. Stokes Co., 1939.

Written for students considering the study of medicine, this book contains a brief discussion of present-day medical education with emphasis on the difficulties of modern curricula. Premedical requirements, costs of medical education and a brief description of each Class A medical school are included. Ten pages are devoted to a discussion of the internship. Special discussion is made of problems peculiar to the Jewish student and to the colored stunt. There is a brief discussion of the specialties, the accessory professions and the future of medicine. The book is brief, well organized and well written.

While presenting an excellent summary of the field covered and containing much valuable factual information, the impression is that for the serious student who may be in a real dilemma on choosing a profession the book doesn't quite get down to business.

CHAS. C. COOPER, M.D.

UNRESTING CELLS. R. W. Gerard, Associate Professor of Physiology, University of Chicago. 439 pp. Illustrated. Price, $3.00. New York: Harper and Brothers, 1940.

This is a most unusual book. During the past ten years knowledge of cell chemistry, cell membrane structure, enzyme nature and action, muscle action, chromosome nature has advanced in astounding fashion. It seems fantastic to suppose that knowledge here gained can be presented with detective-story interest. Gerard has done just that. Secrets of funda-

mental processes within the cell are being learned; cell physiology is no longer an uncharted domain in science. How enzymes do their work, how the chromosomes can multiply and direct cell structure, how the fertilized egg can develop varying cell types —these have been perennial mysteries. The author gives a perspective view of the present concepts on these and other subjects of medical interest: some relations of antibodies, enzymes, hormones, vitamins, of viruses and crystals; the processes of cellular oxidation and anabolism; body oxidases; high points of cellular membrane physiology. The book is brief, has an absorbing style, contains many diagrams well designed to gain clarity. It is highly recommended for the physician who desires knowledge of recent concepts on fundamental processes he sees in the life about him.

C. J. Potthoff, M.D.

THE COMPLEAT PEDIATRICIAN—PRACTICAL PEDIATRICS. Third Edition. Wilburt C. Davison, M.A., D.Sc., M.D., Professor of Pediatrics, Duke University School of Medicine, and Pediatrist, Duke Hospital. 256 Sections. Price, $3.75, cloth. Durham, N. C.: Duke University Press, 1940.

It is indeed a pleasure to again be able to present gleanings and impressions of Dr. Davison's splendid work. The author has admirably succeeded in presenting this third edition as a text of practical value in diagnosis and teaching, by emphasizing symptoms and signs as clues, rather than description: a wonderful step forward from the former method of teaching—mechanical memorization of textbook descriptions of disease.

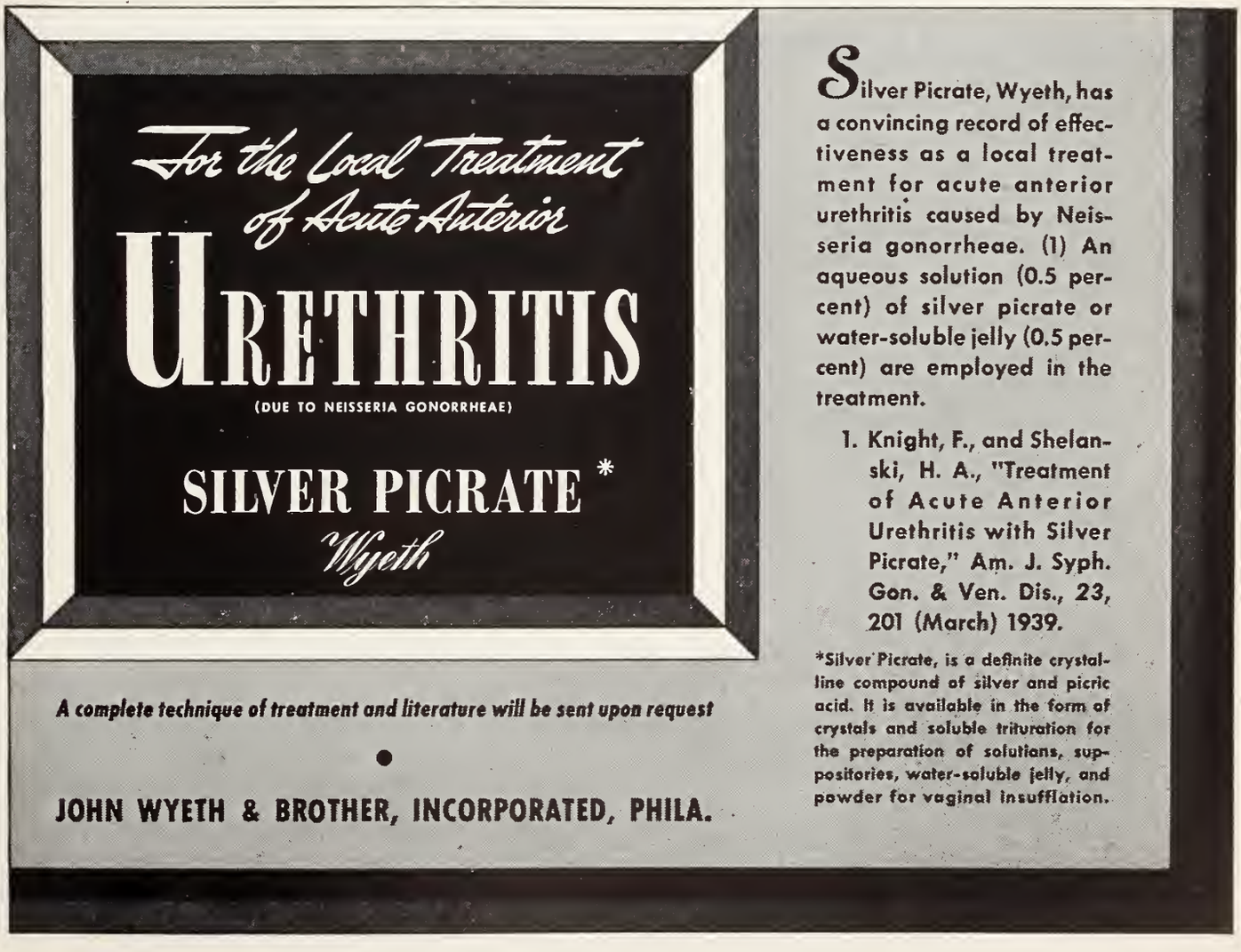
In this edition, 10,000 lines were changed because of the accumulation of additional pediatric information during the past three years. The author very generously expresses his thanks and appreciation to those who so ably rendered assistance. The reviewer notes with congratulations and pride the inclusion of Dr. A. T. S. Davison.

The author has listed the abbreviations used in the text under Instructions. A new paragraph heading, Unproven Remedies, appears. Prognosis is given prominence. This edition, more clearly by large type, simplifies the ready classification.

The reviewer suggests that a text, so very fine—with no equal in the field—receive more cautious proof reading and crictical pre-press scrutiny, particularly in the reference numbers and text content referable to the Index and Drug Sections; also a more extensive and a more detailed, explicit Drug and Prescriptions Chapter; a more complete laboratory presentation of newer, much used methods.

This text, together with each of the author's other editions, well deserves a place on every physician's desk. We shall await the appearance of the fourth edition in 1941.

Lillian L. Nye, M.D.



MANAGEMENT OF THE CARDIAC PATIENT, William G. Leaman, Jr., M.D., F.A.C.P. Assistant Professor of Medicine in Charge of Department of Cardiology, Woman's Medical College of Pennsylvania; Cardiologist Woman's College, Memorial, Northeastern Hospitals and Philadelphia Hospital for Contagious Diseases, etc. 705 pages. Illus. Price $6.50, cloth. Philadelphia: J. B. Lippincott Co., 1940.

Many books on heart disease have been published in the past few years. This one is distinguished by the fact that it deals mainly with treatment. The author discusses each major type of heart disease by first presenting a brief resumé of the pathology, diagnostic signs, and treatment. The treatment is further elaborated by the use of illustrative cases which are in turn discussed by the author. In addition to chapters on the classic types of heart disease such as rheumatic, hypertensive, coronary, etc., there are sections devoted to the heart in pregnancy, allergy and the heart, cardiac emergencies, diet and physiotherapy in the treatment of heart disease, and the use of social service. There is also a chapter on the electro-cardiogram.

The outstanding contribution of this book is the presentation of the treatment of cardiac disorders through the method of illustrative cases. This technique, together with the author's discussions, gives the reader a very practical insight. This book will be appreciated most by those physicians who wish a practical guide to the management of heart disease.

Wm. D. Coventry, M.D.

INTRODUCTION TO BIOCHEMISTRY. W. R. Fearon, M.A., Sc.D., M.B., F.I.C., Dublin. 2nd edition. 475 pages. Illus. Price, $3.75. St. Louis: C. V. Mosby Co., 1940.

This book is very clearly written in the almost typical British outline form by which the vast amounts of information can be written in a rather small volume. The pure biochemical considerations are very complete and are interesting in that a considerable amount of emphasis is placed on the chemistry of inorganic matter in relation to general physiologic chemistry. The consideration of inorganic chemistry is usually minimized in most American biochemical texts. I feel, however, that the book lacks correlation with the physiologic processes as they occur in the body and for this reason it is quite difficult to follow the general trend of the text. The sequence is purely chemical.

This book should find wide acceptance among teachers and students of physiologic chemistry *per se*, but it lacks applicability to the needs for chemical information sought by the practicing physician and medical student.

J. J. Grabow, M.D.

MINERAL METABOLISM. Alfred T. Shohl, M.D., Research Associate in Pediatrics, Harvard University. American Chemical Society Monograph Series. 384 pages. Price, $4.50, cloth. New York: Reinhold Publishing Corporation, 1939.

The two-fold purpose served by these monographs, to present the knowledge available in an intelligible, understandable form and to promote research through the context's well-digested survey of the up-to-date progress and through suggested avenues of investigation, is well fulfilled in this text. Every one interested in the field of mineral metabolism will profit by reading this presentation, both from the laboratory and clinical standpoints.

Lillian L. Nye, M.D.

TRICHOMONAS VAGINALIS IN THE MALE

(Continued from page 110)

In addition there were quite a few pus cells and also live trichomonas vaginalis. His wife had been examined by an excellent gynecologist, but no trichomonas vaginalis were found in her discharge. The urine was acid, sp. gr. 1030, very faint trace of albumin, a few r.b.c., an occasional w.b.c., full of mucus and calcium oxalate crystals, but no trichomonas vaginalis were found. I ordered a condom specimen which was brought three-quarters of an hour after coitus and after four days' continence. The specimen was not brought in a condom however but in a rubber finger because, as previously mentioned, he never ejaculates though he has orgasm, but about ten minutes later a thick mucoid ejaculation appears at the meatus, and it was this specimen brought in a rubber finger which I examined. The specimen showed very many lively spermatozoa. I never saw such lively spermatozoa and they acted as if something was chasing them. Even hours later and without any special precaution they were still found to be exceedingly lively. The specimen itself was much thicker than ordinary semen, but this did not in any way interfere with the motility of the spermatozoa. A careful search, moreover, did not reveal the presence of trichomonas vaginalis in this specimen. As the patient made no further visits after this examination, it was impossible to make any further studies of this interesting condition.

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PRELIMINARY REPORT OF THE SPECIAL OTTER TAIL COUNTY TUBERCULOSIS SURVEY*

Summer, 1940

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THE major field project of the Otter Tail County Sanatorium in 1939 was the Mantoux testing of the high school students of the county. During the year, 1,416 school children from the seventh through twelfth grades were Mantoux tested. A total of 124 children who reacted positively were x-rayed, and those children known to have a positive Mantoux from previous surveys and still in school were re-x-rayed. No cases of tuberculosis requiring treatment were found. It is the writer's conception that a sanatorium is not only a hospital for the care of a limited number of patients, but it should be an institution whose function is the control of tuberculosis in the area which it serves. In the control of tuberculosis, it must not only treat tuberculous individuals in an attempt to get them well, it must prevent the development of tuberculosis which, as in other diseases, is the goal to be attained. Tuberculosis being a contagious disease, there is only one way of preventing it, and that is by the discovery and isolation of every active open case. In 1939 the sanatorium had not accomplished its function, the major field project had been high school Mantoux surveys, and with these surveys not a single case of tuberculosis had been discovered.

An analysis was made of the Sanatorium admissions for the year 1939. Of the seventeen admissions which were cases previously unreported, twelve, or 70 per cent, were classified as far advanced, four, or 23 per cent, as moderately advanced, and only one as in the minimal stage. Obviously those with far and moderately advanced disease had had tuberculosis for some time and a different case finding program might have found some of them in an earlier stage. On further analysis of all the Sanatorium admissions for the year 1939, a total of 33 patients, sixteen, or 48 per cent, were found to be individuals who had been previously treated in tuberculosis sanatoria in whom the disease had again become active; and eleven others, or 33 per cent, gave a history of tuberculosis having existed at some previous time in some member of the immediate family. These two groups totaled 81 per cent of the admissions for the year. If the disease had again become active in some former patients, was it not possible that it had become active in others who had not come up for examination? If members of the immediate families of some of the old cases of tuberculosis were now developing tuberculosis, was it not possible that members of the immediate families of other old cases were also developing tuberculosis? It appeared that making the examination of reported cases and their families, the only project in field work for 1940 would reveal not only cases of active open tuberculosis, but also cases of tuberculosis in minimal stages even before symptoms became apparent, thus detecting and making possible the healing of incipient cases of tuberculosis before they became infectious.

To examine old cases and their families is not a new method of case finding. The Sanatorium in Otter Tail County has always carried on such a program as part of its field work. The only

*Read at the Minnesota State Sanitary Conference, November 29, 1940, Minneapolis.

change proposed was that all the available time and funds, both of which were very limited, be devoted to this one project.

Dr. H. G. Lampson,[4] reported in 1915 that:

1. "A very large percentage, 79 per cent, of the individuals fully exposed for a long period of time to open cases of tuberculosis became infected.
2. "A much smaller percentage, 28 per cent, of those partially exposed or exposed for a short period of time became infected.
3. "The percentage of infections from casual exposure, such as everyone encounters, was small—8 per cent.
4. "The more frequent infections of children may be explained, at least in part, by their more intimate contact with the patient.
5. "At all ages the intimacy and length of exposure are the determining factors in infection with tuberculosis."

Dr. David Zachs[7] found that two out of every three children who exhibit grave tuberculous lesions of the adult type came from families that show a tuberculosis morbidity of 41.7 per cent and a case mortality of 49.1 per cent, and he concluded that "these considerations point to the family relationship as a source of greatest danger in childhood and youth." H. R. Edwards[2] states: "The examination of the exposed contacts to tuberculosis should logically reveal more new tuberculosis than the examination of any other group, and experience everywhere confirms this if the source case has been known to have bacilli in the sputum. . . . The adult contact is more likely to reveal new manifest disease than the child." In mass surveys carried on under his direction since 1933 in the City of New York, 162,446 individuals from fifteen population groups were x-rayed and 4 per cent were found to have reinfection tuberculosis, 2.5 per cent being clinically significant, i.e., active. One of the population groups consisted of 16,810 college students, only .3 per cent of whom were found to have reinfection tuberculosis, only .2 per cent clinically significant. Another population group consisted of 15,795 high school students, with .4 per cent found to have reinfection tuberculosis, and .4 per cent clinically significant. All other population groups consisting of adults showed higher percentages than either of these. In a study conducted by Edwards and Unzicker[3] in New Haven, Connecticut, they reported that the actual cost of finding a new case of pulmonary tuberculosis by the examination of the contacts of cases of tuberculous meningitis was $78.00, by the examination of the contacts of cases of pulmonary tuberculosis $140.51, and by the examination of the contacts of children with positive Mantoux tests it was $1,063.50. F. T. Lord[5] states that in Massachusetts they have found one child in every 700 high school children examined to have adult tuberculosis. The cost of finding one case averages $1,000.00.

To make the examination of reported cases and their family contacts the only project meant, of course, that the Sanatorium must omit the other activities which it had previously carried on as a part of its field work, and the question was therefore discussed with the local medical society and the Otter Tail County Public Health Association. Both groups offered their enthusiastic support. Since funds and personnel were both limited, a very modest program was proposed. Fortunately, Dr. A. J. Chesley, of the Minnesota Department of Health, heard of the program and offered the assistance of the Minnesota Department of Health. Dr. Hilbert Mark, Epidemiologist in tuberculosis in the Division of Preventable Diseases, Minnesota Department of Health, was assigned to this survey. Funds for the purchase of x-ray films and for the employment of an x-ray technician and a clerk were made available from Social Security Funds through the Minnesota Department of Health and the Division of Social Welfare of the Department of Social Security. Through the coöperation of the Sanatorium Commission and the Otter Tail County Public Health Association, the Sanatorium field nurse was freed from her routine duties and assigned to the survey.

As one part of the survey, it was planned to examine all individuals with tuberculosis now living in Otter Tail County. The list of cases reported to the Minnesota Department of Health from Otter Tail County was used as an index. The registration of cases began in 1913 when tuberculosis was made a reportable disease. Since in 1939 about 19 per cent of persons dying from tuberculosis had not been previously reported as having tuberculosis, it was recognized early that the Minnesota Department of Health lists were incomplete, and local sources were used for clues to unreported cases. The other part of the survey was the examination of the members of the families of all reported cases of tuberculosis who were still living in the county. In locating the original

reported case, or if he was not available, his family, a visit was made to the postmaster, the physician, the health officer, the village or town clerk, and the old settlers in the locality of his last known address. A visit was then made to the home of the reported case, or his closest kin, and two forms were completed, one for the family, and one for the patient. The reported patient was given an appointment for an x-ray, and, if expectorating, two sputum specimens were collected for cultural study. His family, except for those known to have a positive Mantoux test from previous examinations, were requested to report at a Mantoux clinic in one of eight cities and villages selected for holding Mantoux clinics. Adults (except a few who presented themselves later than on the first day of each of the clinics) were given an initial Mantoux test with a 1:10,000 dilution of Old Tuberculin and if negative in forty-eight hours the examination was repeated with a dilution of 1:100. The 1:10,000 dilution was used first on adults since it was felt that a significant number of adults would react to this weaker solution, and in that way avoid painful local reactions which might possibly occur with an initial test of 1:1,000 dilution. The 1:100 dilution was chosen for the second test dose since it was known from studies at the University of Minnesota Medical School[1] that some 10 per cent more would react to a dilution of 1:100 than to 1:1,000, and it was felt that a test with the 1:100 dilution would not produce an inordinately severe reaction in adults negative to the 1:10,000 dilution. All children under twelve were given an initial test with a dilution of 1:1,000, and most of them were not retested. Adults who came to the clinic after the first day of testing were given one test with a dilution 1:1,000. All tuberculin used was Old Tuberculin freshly diluted for each clinic and furnished by the Minnesota Department of Health. All those found to have a positive Mantoux and all family contacts with a previously known positive Mantoux were given an appointment for an x-ray at the Sanatorium. Practically all the x-ray films were sent for reading to the roentgenological staff of the University Hospital, and every x-ray which exhibited evidence of reinfection tuberculosis was sent to them for confirmation. The report of the x-ray was made in writing to the family physician of the individual in each instance, together with recommendations insofar as tuberculosis follow-up was concerned. No reports were given to lay individuals.

The survey has now been completed in the eight areas into which the county was divided. In the county a total of 1,605 individuals had been reported from 1913 to the summer of 1940 as having tuberculosis. Of these, over 900 had died, nearly 200 had moved out of the county, over fifty were in some one of the several institutions in this state for the care of the tuberculous, about 100 could not be located, and there were an even 200 still living in the county. To date, 164 of the 200 remaining in the county have reported for examination, of whom twenty-one were found to have active open tuberculosis, and again in need of sanatorium care.

Field investigations revealed 698 family groups having a history of familial exposure to one or more cases of tuberculosis still residing in those areas. The term, family group, as used in this survey, more closely approximates an epidemiological unit than a family. Supposing two brothers had tuberculosis, and that each was married, with a wife and children. The family group in that case would consist of their father, mother, brothers, sisters, and each one's wife and children, three different families which make up the one family group. In these 698 family groups, 3,867 individuals were found residing in Otter Tail County. All of the 3,867 individuals except those with previously positive Mantoux tests were asked to attend the nearest Mantoux clinic. Of these, 1,522 presented themselves for Mantoux tests, and 765 were positive. At present, figures are not available on persons known to have had positive Mantoux tests previously and who were not retested at the clinics. Altogether 1,168 family contacts with positive Mantoux reactions have been x-rayed, and fourteen supposedly healthy persons were found to have active reinfection tuberculosis requiring sanatorium care. Six, or 45 per cent, were minimal, three, or 21 per cent, were moderately advanced, and five, or 35 per cent, were far advanced.

It is interesting to compare this with the previously unreported cases admitted to the Sanatorium in 1939. In 1939 only one new patient was admitted with a minimal lesion, 6 per cent of the seventeen previously unreported cases admitted.

An additional forty-four individuals were found to have reinfection tuberculosis, which ap-

pears inactive on x-ray but which will require further study to definitely determine activity.

The cost of the survey may be subdivided under the following headings:

Visits in the field, including salaries, travel expense, etc.	$3,296.86
Mantoux clinics salaries	399.75
X-ray expense, including salaries, x-rays, developing, etc.	1,195.20
Clerical expense, including salaries, postage, supplies, etc.	679.04
Total	$5,570.85

The cost as listed above is the total cost. No charge was made for interpretation of x-rays by the University of Minnesota Hospital staff. Included in the cost, however, is a proportionate share of the salaries of all regular Sanatorium employes who devoted part time to the survey, though their salaries were continued by the Sanatorium.

An estimate made by the Eastman Kodak Company[6] at Rochester, New York, as a result of a survey among 100 tuberculous employes disclosed that the average cost per individual for diagnosis, treatment, examination of contacts, and time lost from work was $4,000. The cost of the completed survey in this county is $5,570.85.

It is difficult to state the cost per case discovered because the survey consisted of two parts: (1) the examination of previously reported cases of tuberculosis; and (2) the examination of their family contacts. It is impossible to determine what proportion of the total cost should be applied to each group. In addition, some of the cases found are clinically unimportant and perhaps should not be considered. If one considers only the fourteen cases of active tuberculosis found among the family contacts, and divides the total cost by fourteen, one finds the cost per case to be $397.91. If one considers all the reinfection tuberculosis discovered among the family contacts, whether active or apparently inactive, a total of fifty-eight cases, one finds the cost per case to be $96.05. If one considers the fourteen cases of active reinfection tuberculosis found among the family contacts and the twenty-one cases found to again have active tuberculosis in the group of previously reported cases, a total of thirty-five, one finds the cost per case to be $159.14. If one considers all types of cases discovered, that is, the fourteen active and the forty-four apparently inactive reinfection tuberculosis in the family contacts, and the twenty-one found to again have active tuberculosis in the group of previously reported cases, a total of seventy-nine cases, the average cost is $70.52.

Could such results be duplicated in other parts of the state? Is Otter Tail County unusual in any respect? It is a large county of sixty-two townships, with a population in 1930 of 51,006. Sixty-five per cent of the population, 33,246 people, live in rural areas. There is only one city, Fergus Falls, with a population of 9,389, and seventeen villages, eleven with a population under 500, four with a population between 500 and 1,000, and two with a population between 1,000 and 1,500. There are only 107 individuals of races other than white. Of the whites, 84.5 per cent are native born, 15.5 per cent foreign born.

The Sanatorium was built in 1913 and it was the second county sanatorium established in the State of Minnesota. Through education, the people of the county have gradually come to accept the services of the Sanatorium. In the five-year period, 1915-1919, there were 183 people who died of tuberculosis in their homes, 69.5 per cent of the 263 deaths from tuberculosis. In the five-year period, 1935-1939, only twenty-five people died from tuberculosis in their homes, only 33.8 per cent of the seventy-four deaths. The morbidity and mortality rates from tuberculosis have been steadily falling, and the county has a record as good as the state average. In the five-year period 1915-1919, 429 people were reported as having tuberculosis; in the five-year period, 1935-1939, only 143 were reported, exactly one-third. In 1915-1919, there were 263 deaths from tuberculosis; in 1935-1939, only seventy-four, less than one-third. The average mortality per 100,000 in Otter Tail County in the five-year period, 1935-1939, was 29.01. The mortality in the state as a whole in 1939 was 30.2. That is a record to which Otter Tail County can point with pride. But, it was still possible to find thirty-five cases of active tuberculosis requiring sanatorium care. Is Otter Tail County unusual?

If such a survey as is in progress in Otter Tail County is considered valuable, and if such surveys are to be carried on in other parts of the state, how are they to be financed? Such a survey would not have been made in Otter Tail County without the assistance of the Minnesota Department of Health and the other coöperating

groups. Should not the counties make more funds available for such inexpensive case finding? The state provides financial assistance to the counties in the care of their indigent tuberculous patients by defraying a portion of the sanatorium cost. Should not the state also subsidize case finding programs? If the state should bear part of the cost of case finding programs, should its contribution be in the form of personnel temporarily assigned to the institution, as is the case in the present survey, or should its contribution be a cash subsidy to the institution for the partial support of the institution's own program? Will funds be made available by the state to partially meet the cost of continuing such surveys? After all, in the present survey less than one-third of the 3,867 family contacts, and only about eighty-two per cent of the 200 reported cases living in the county have been examined. In 1935, the State Board of Health, in accordance with recommendations of the Advisory Committee on Tuberculosis, submitted to the Legislature for its consideration a request for funds to aid the various sanatoria and the State Board of Health in such work.

For several years in this state there has been doubt as to the efficacy of the present sanatorium set-up for the control of tuberculosis. It has been felt that some of the smaller institutions have out-lived their usefulness and might possibly be replaced by larger district sanatoria; that tuberculosis has so decreased that it is impossible to keep the beds filled. It has been felt that these institutions, being small and in many cases not fully equipped, are unable to give adequate modern treatment for tuberculosis, treatment which in recent years has laid more and more emphasis on surgical procedures. If funds were available for more adequate case finding programs we would find in most areas in Minnesota that we would not have too many beds for tuberculosis, but too few. A small institution cannot offer as complete and adequate medical service to its patients within its own walls as may a larger institution, but in most cases the necessary additional treatment is easily available to the patients of small institutions by their referral for short periods to more adequately equipped institutions. More adequate case finding programs should result in the discovery of a larger percentage of minimal cases of tuberculosis. These minimal cases, as they do not require the facilities of the large institution in their treatment, could be cared for as well in small institutions near the patients' homes, and much of the need for new large institutions might disappear.

A sanatorium logically acts as a case finding center for the area which it serves. Before we decide to abandon the small institution now giving a concentrated case finding program to a small area of one, two, or three counties, we should be sure that the new plan for the control of tuberculosis will make at least an equally adequate provision for case finding in these areas.

A preliminary report of the tuberculosis case finding survey in Otter Tail County has been presented. Of 164 previously reported cases examined, twenty-one again were found to have active, open tuberculosis. Of the family contacts of previously reported cases, 1,168 persons were x-rayed. Of these, fifty-eight were found to have reinfection tuberculosis; in fourteen the lesions were definitely active, and the individuals were in need of sanatorium care; the lesions in forty-four appeared inactive but further study of these individuals is necessary. The importance of an adequate case finding program in tuberculosis has been emphasized, and the rôle of a small institution in such a program outlined.

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COCCIDIOIDAL GRANULOMA: A BRIEF REVIEW WITH REPORT OF A CASE OF MENINGEAL INVOLVEMENT*

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FOR the past fifty years the study of pathogenic yeasts and fungi has held the attention of the botanist, the medical mycologist, the dermatologist, the medical internist, the surgeon and the pathologist. Years of research have brought to light many interesting observations on the life cycles of these lowly pathogens. Early difficulties in classification and identification of species gradually have been overcome and the pathologic lesions peculiar to the individual fungi elucidated. Among these pathogenic fungi, the coccidioides holds a prime position from the pathologic and mycologic standpoints. In addition, the disease it produces in man has a peculiar geographic distribution.

Historical Aspects

Wernicke, in 1892, described a case of dermatitis with abscesses encountered in Buenos Aires from which protozoan-like organisms were obtained. Death occurred and in 1900 Posadas gave a detailed account of the lesions. In the meantime (1894 and 1896) Rixford and Rixford and Gilchrist reported instances of a similar fatal infection occurring in two California laborers. Among the numerous and important contributions of these two early investigators were the observations that the organisms were spore forming in the lesions, that they elicited tissue reactions similar to those produced by the tubercle bacillus, and that rabbits were susceptible to inoculation by material from human lesions.

Although they noted a resemblance between the organism they described and the known fungus of blastomycosis, these investigators believed they were dealing with a protozoan (coccidioidal) infection. Stiles, a medical mycologist, named the parasite "Coccidioides immitis." That the parasite was in fact not a protozoan but a pathogenic mold was shown by Ophüls[9] in 1900. From material obtained in a case encountered by him this investigator demonstrated that the organism could be grown on artificial culture media and that it grew as a mold with the production of white mycelia. He classified it with the oidia, but suggested that out of respect to Rixford and Gilchrist the generic name should be retained. He proposed the designation "Oidium coccidioides" for the organism. Clinically he recognized cutaneous, pulmonary and mixed forms of the disease and he believed that the lungs as well as the skin were frequently the portal through which infection entered. Pathologically, he postulated that the sporulating form of the organism, seen only in tissue lesions, was merely one phase in the life cycle of the mold. Dickson, in 1915, reviewed the literature and found reports of forty cases of coccidioidal granuloma. He remarked at that time that thirty-five of these had been observed in California and that twenty-seven of these had been residents of or visitors in San Joaquin Valley. He gave 90 per cent as the mortality rate in the generalized form of the disease.

The condition by this time had become known as California disease. Many cases were reported in the literature and many valuable contributions were made by Moore, Benham, Meyer and others on the life cycle of the organism. In 1929, Dickson[3] showed conclusively that infection did occur via inhalation of chlamydospores produced in the vegetative phase and that the incubation period was about nine days.

In the period from 1929 to 1938 this same author made a discovery which startled the medical world and opened up a new field for the study of coccidioidal infection. For years the residents of the San Joaquin Valley had experienced epidemics of what was locally named valley or desert fever. This self-limited illness took the form of a severe influenza-like infection of the upper part of the respiratory tract with chills, fever, cough and expectoration. In 80 per cent of the cases within eight to fifteen days of the onset lesions simulating those of erythema nodosum appeared on the extremities. These lesions faded after four to five days; cough and other symptoms cleared up usually in three to four weeks. Dickson cultured sputa from a num-

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ber of these cases and found coccidioides in more than 70 per cent. In only one out of more than 350 cases of valley fever observed within a period of eighteen months did the disease progress to the stage of generalized dissemination. This patient died of coccidioidal meningitis.

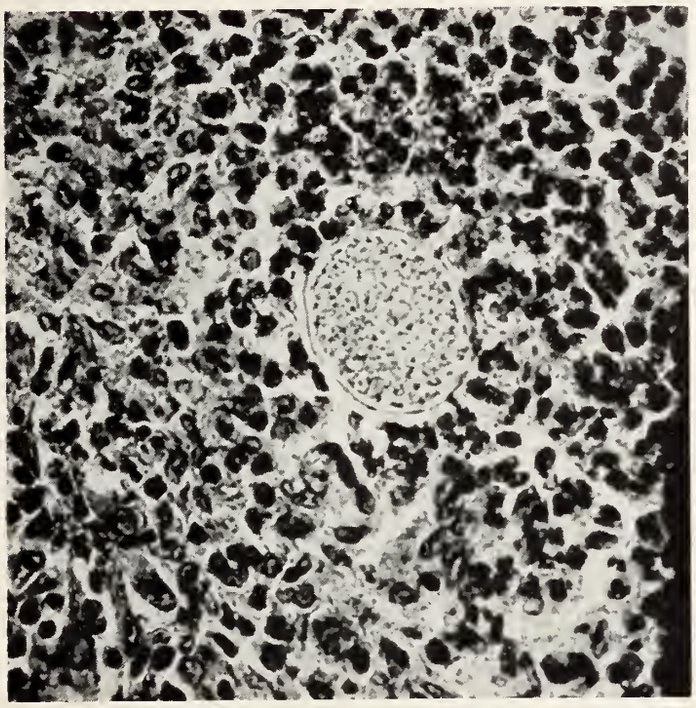


Fig. 1. Large oval doubly contoured and spore filled organism, Coccidioides immitis from specimen removed from the brain at operation. The acute inflammatory exudate forming a micro-abscess may be noted (hematoxylin and eosin, x475).

That valley fever is only one manifestation of coccidioidal disease is an observation, the importance of which cannot be overestimated. It serves to emphasize more than ever the peculiar geographic localization of the disease, its high morbidity and relatively low mortality rate when considered in all its phases, and from the standpoint of lack of immunity it explains perhaps why visitors to the San Joaquin Valley run special hazards of developing the granulomatous form of the disease. Coccidioides appears to be endemic in other localities, namely, Colorado, New Mexico, Brazil and the Argentine. However, doubt has recently been thrown on the authenticity of cases reported from South America. Of the many recorded cases of coccidioidal infection from South America Moore accepted only two. The remainder he considered as being caused by the organism Paracoccidioides, a fungus more closely related to the organism of blastomycosis than to Coccidioides immitis.

The general mortality rate of the disease including the cutaneous form and excluding valley fever is approximately 50 per cent.[18] At necropsy the lungs are practically always involved but almost every organ of the body has at one time or another been reported as the seat of metastatic lesions. Apparently both the blood and lymph participate in the general dissemination. In all of the seven cases[4,10,12,15,17] (including the one to be reported) of involvement of the central nervous system which have been reported in the literature the disease was fatal; basilar lesions have been present in all instances and in several meningeal involvement of the cervical portion of the spinal cord.

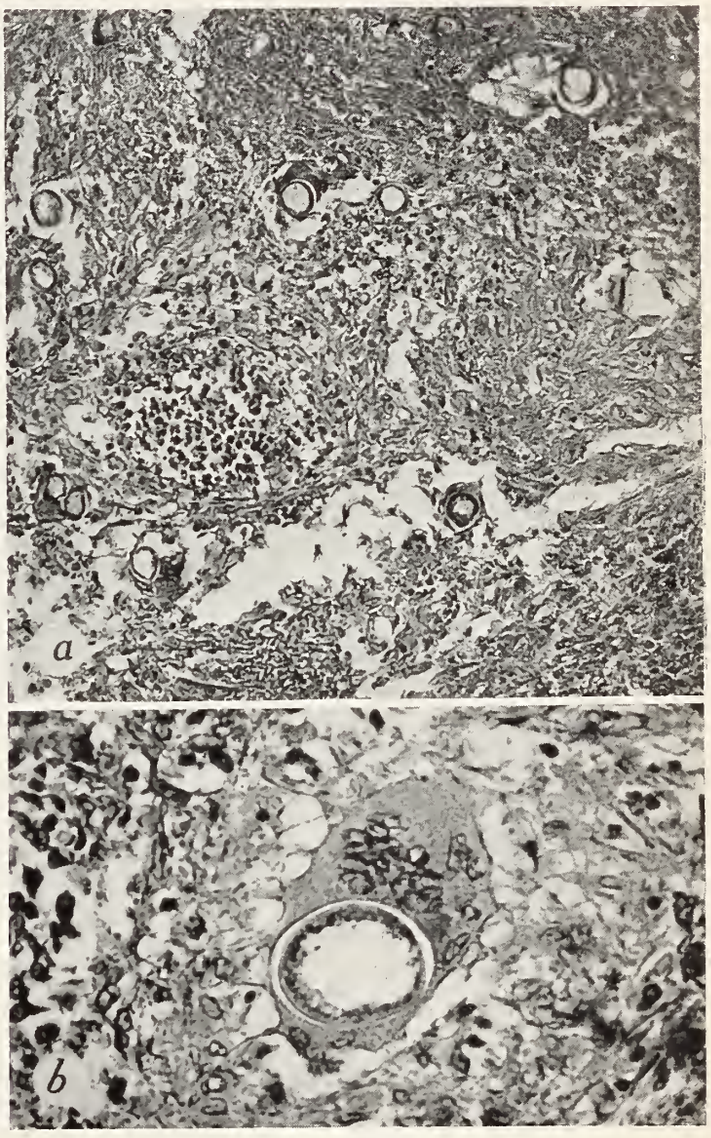


Fig. 2. Lesion from lung; *a*, coccidioidal organisms and surrounding chronic inflammatory reaction with numerous giant cells and moderate fibrosis in a nodular lesion from the right lung. The resemblance to tuberculosis is apparent (hematoxylin and eosin, x140). *b*, The coccidioidal organism within a giant cell (hematoxylin and eosin, x400).

The diagnosis of coccidioidal granuloma is usually made in the laboratory, either from a study of smears or sections of accessible lesions, sputum, and so forth, or by means of culture. In some cases the coccidioidin skin test furnishes additional evidence, but as pointed out by Dick-

son, aggravation of symptoms may follow the subcutaneous injections of any but minute doses of the toxin. The matter is being further investigated.

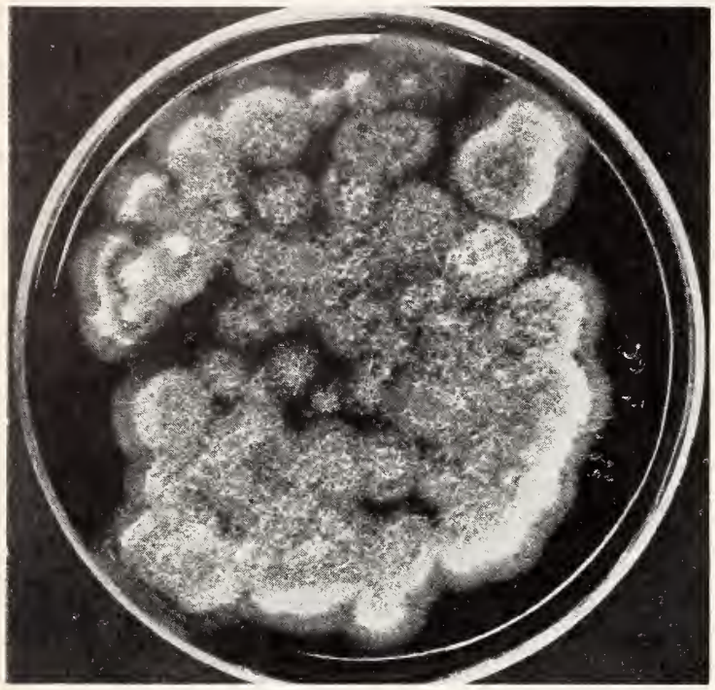


Fig. 3. Ten-day growth of coccidioides from infected brain. The colonies appear "fuzzy."

Treatment is unsatisfactory as a study of mortality statistics and a review of the numerous and varied remedies that have been tried indicate. Perhaps future investigation will confirm the findings of Jacobson whose coccidioidal vaccine employed in a series of twenty-four cases gave a number of apparent cures. All of Jacobson's patients survived except two who had meningitis.

Report of Case

The patient, a man aged forty-nine years, who had always lived in Iowa, registered at the Mayo Clinic on May 9, 1940, and gave a history that he had spent a vacation of two weeks in southern California in March. On April 25, which was about a month after he left California, mild occipital headaches developed. They were dull and throbbing and fairly constant except that they were worse in the morning. The headaches were made worse by bending over, but there was no extension of pain down the neck and no stiffness of the neck. A few days after the onset of the headache, he began to notice a dull ache about the left eye, and following consultation with an eye, ear, nose and throat specialist, his antrum was lavaged without any relief of pain. Five days before admission to the clinic the pain became intense, and he was confined to bed. As long as he lay quietly, he was fairly comfortable, but the minute he arose, the pain became very severe. Projectile vomiting occurred the day of his admission.

Neurologic examination gave essentially negative results except for marked incoördination of the patient's hands and arms. Spinal puncture was done; the Kolmer and Kline tests on cerebrospinal fluid gave negative results, and the values for globulin and



Fig. 4. The mycelia from the culture shown in Figure 3 with hyphæ and chlamydospores.

total protein were within normal limits. There were a few lymphocytes and a few polymorphonuclear leukocytes. Examination of the cerebrospinal fluid threw no light on the nature of the condition, but immediately after the spinal puncture the headache became much worse, Cheyne-Stokes respiration occurred, and the patient appeared quite sick.

The patient was hurried to the operating room, a bur hole was made quickly, and the right lateral ventricle was drained. The fluid was under moderate pressure, although the examination of the eyes had revealed no evidence of papilledema. Immediately following the relief of pressure, respiration became quieter, and his condition improved. The next day he felt fairly well, and we were able to reëxamine him. The only positive finding was the persistent incoördination. Our impression was that we were probably dealing with a tumor of the fourth ventricle, as we have seen patients with these tumors react in a similar way to examination and spinal puncture.

The spinal puncture was done on May 11, and on May 14, under ether anesthesia, with the patient in the upright position, bilateral cerebellar craniotomy and decompression were performed. The fourth ventricle contained no evidence of tumor. However, in the upper outer quadrant of the left cerebellar lobe at a depth of about 2 cm. a mass was found. When the cortical vessels were ligated and the cortex was divided with an electrosurgical unit down to the tumor, we thought we were dealing with a fairly well circumscribed gliomatous mass. When a portion was removed for biopsy and diagnosis from a frozen section, there was a gush of seropurulent material which at first seemed to be mucoid in nature. The brain was quickly protected and the entire mass was removed. At

first, this mass seemed to be neoplastic although it was associated with a great deal of inflammatory reaction. Examination of the frozen tissue suggested an abscess of unknown origin, and the contents were sent for culture. The lesion was treated as an abscess with drainage, and chemotherapy was instituted immediately. Fixed sections of the lesions, which will be described later in this paper, revealed Coccidioides immitis, and evidently we were dealing with coccidioidal granuloma of the brain.

During the entire illness the patient's temperature was elevated a little. The catheter left in the lateral ventricle for drainage drained large amounts of cerebrospinal fluid; when it was clamped off, the headache returned. This led us to believe that occlusion of the aqueduct of Sylvius was present and probably due to ependymitis. The patient was conscious, quite clear mentally, and if we had not known the etiology of his condition, we would probably have thought he was improving.

Sulfanilamide, sulfathiazole and other chemotherapeutic drugs were used without effect. At the end of four weeks his condition seemed about the same except for some marked drowsiness, although he could be aroused with difficulty. Suddenly on June 13, 1940, he had difficulty in breathing, acute respiratory embarrassment developed and death occurred.

TABLE I. TISSUE DIAGNOSIS: DIFFERENTIAL POINTS

Organism	Disease	Reaction	Cellular products	Budding	Spores	Distribution of lesions
Blastomyces * dermatitidis	Blastomycosis	Acute, with polymorphonuclear neutrophils	None	Always	Never	Skin and generalized (lungs especially)
Coccidioides immitis	Coccidioidal granuloma	Acute, with polymorphonuclear neutrophils	None	Never	Always	Skin and generalized (lungs especially)
Debaryomyces neoformans	Torulosis	Mild chronic	Mucoid material	Sometimes	Never	Usually in brain, meninges

*The fungus "Zymonema dermatitidis" has been named by some as the etiologic agent in blastomycosis. However, because absolute proof of this is lacking, Henrici and others are in favor of retaining this older term, manifestly inaccurate, but justified on the basis of usage.

TABLE II. LABORATORY DIAGNOSIS: DIFFERENTIAL POINTS

Organism	Disease	Organisms in culture			Pathogenicity for animals
		Mycelia	Ascospores	Colonies	
Blastomyces* dermatitidis	Blastomycosis	Always	Never (?)	Dry and fuzzy	Slight or absent
Coccidioides immitis	Coccidioidal granuloma	Always	Never	Dry and fuzzy	Marked for all laboratory animals
Debaryomyces neoformans	Torulosis	Never	Recently demonstrated	Moist (mucoid)	Marked for rats and mice; slight for guinea-pigs (principally brain lesions)

*See footnote on Table I.

Pathology

The surgical specimen, received from the operating room, on staining with polychrome methylene blue, presented at once the features of an acute inflammatory process. Occasional giant cells were seen and tuberculosis was con-

sidered as a possibility although the acuteness of the inflammatory process seemed rather unusual. Study of fixed frozen sections stained with hematoxylin and eosin revealed an acute and subacute inflammatory reaction with micro-abscesses. Within these tiny abscesses were seen round to oval doubly contoured refractile bodies varying in diameter from 8 to 15 microns. Occasional lanceolate forms were observed. Most of these bodies were completely filled with minute round spore-like structures (Fig. 1). In some instances these granular masses had ruptured through the capsule of the mother cell and spilled into the surrounding tissue. Occasional giant cells were encountered; some had engulfed the large organisms but in most instances the latter were seen in the midst of collections of polymorphonuclear leukocytes. Budding and the "spine" forms of the organism described by Benham and others were not observed.

At necropsy the material of interest consisted of the brain and the lungs. In the former, around the operative site, the inferior pole of the left cerebellum, and the lining of the fourth ventricle a purulent inflammatory exudate was visible grossly. The left cerebellar hemisphere was the seat of an abscess 1 cm. in diameter. Cerebral edema and hydrocephalus were superadded as a result of blocking of the passage of cerebrospinal fluid.

Both lungs contained multiple indurated grayish red nodules with caseous centers. These nodules were scattered throughout both lungs and had the gross features of chronic but active tuberculosis. No other gross lesions were observed.

Microscopic examination of the lesions of the brain presented the picture previously described. The pulmonary lesions proved not to be tuberculous but were nodules of coccidioidal granuloma. They appeared older than the cerebral lesions by virtue of a more chronic inflammatory reaction with many foreign body giant cells (Fig. 2*a* and *b*). This finally fitted in with the well recognized fact that the primary lesion of coccidioidal granuloma is frequently pulmonary. The results of cultures from the lesions are clearly shown in Figures 3 and 4 and need no special comment. Even without guinea-pig inoculation the diagnosis of coccidioidal granuloma was the only one fitting the recorded facts of the case. For a brief summary of the classic features which served to distinguish the closely allied conditions of blastomycosis, coccidioidal granuloma and torulosis, Tables I and II, modified from Benham, are appended.

Summary

A short account is given of the history of Coccidioides and the geographic distribution of the disease which it causes. In our case of coccidioidal granuloma the symptoms were the result of intracranial involvement, but the primary lesion was of pulmonary origin. The infection was almost certainly acquired by the patient during a brief sojourn in southern California.

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How long ago it seems. In 1859 Mr. Richard C. Downing, Superintendent of Sanitary Inspection of New York City, said, "I consider it very unjust to give the health inspector of the City of New York power to quarantine a house where there is smallpox."—*Better Times,* Dec. 13, 1940.

ANATOMY, PHYSIOLOGY AND SURGERY IN DUODENAL STASIS*

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Report of Case

J. E., a man aged twenty-five, had suffered since childhood from epigastric distress, nausea, a full feeling for some hours after eating, and a great deal of belching. There also was abdominal pain present. These symptoms all were at their worst when he was in the upright position; while in the reclining position he was a great deal easier. He was especially distressed after eating wieners, cold slaw, and highly seasoned foods. As long as he can remember he became nauseated or vomited when riding in a street car or train. As a railway mail clerk, he vomited many times while on duty. This simulated sea sickness, but was accompained by a bloated feeling. At this time an x-ray examination by Dr. Schons of St. Paul revealed, under the fluoroscope, a back and forth churning of the food column in the horizontal portion of the duodenum. A diagnosis of duodenal stasis was made. The patient was then placed on a lengthy medical regime.

An appendectomy had been done in 1931. The symptoms were not relieved by the removal of the appendix.

In June, 1937, the patient had improved under medical care and bed-rest, but as soon as he again went about his activities, he had the same misery. On September 18, 1937, he entered St. Joseph's hospital where another x-ray examination showed the same findings as before; no evidence of ulcer or carcinoma of the stomach or ulcer of the duodenum. There was quite a marked dilatation of the duodenum together with reverse peristalsis and churning of the food column in the right sided portion of the duodenum.

I first saw the patient who was referred by Dr. J. Lepak, on September 22, 1937. Operation was advised as the x-ray diagnosis was definite and a medical regime was insufficient to permit the patient to work.

On September 23, 1937, the operation was done under spinal anesthesia. Upon close examination of the third portion of the duodenum I found that by telescoping the jejunum into the duodenum that two fingers readily passed into the lumen. This convinced me that there was no intrinsic disease of the duodenum. I was impressed, however, by the embarrassing mechanical situation consisting of a narrow slit-like communication between the third and fourth portion of the duodenum. There was a formidable barrier to the patency of the tube due to extrinsic pressure of an overlying band of fat, containing the superior mesenteric artery and vein. The two entering fingers could readily lift this barrier but that was more lifting power than could be exerted by the peristaltic wave and besides the patient was in the supine position, in which there was less drag on the artery. A side to side duodeno-jejunostomy was made. The first two postoperative days required duodental tube suction. After that the convalescence was uneventful and on the fifth day the patient sat up in the chair feeling well.

Four weeks later he reported, "The former distress is gone, I have no sour stomach and no distressing belching."

Four months later an x-ray examination was made of the stomach and duodenum and we saw a duodenum with a normal lumen and the food passing through the recently made stoma.

In a letter of February 1, 1939, the patient stated, "I now enjoy good health for the first time in my life."

He now weighs 15 pounds more then he had ever weighed before.

Comment

The anatomic arrangement of this area in man is rather interesting and it becomes even more fascinating when comparing it to the anatomy in animals. In man the superior mesenteric artery leaves the abdominal aorta at an acute angle and extends caudally. At the apex of this angle is the left renal vein and next caudally is the duodenum. The superior mesenteric artery supplies the jejunum, ileum, cecum, ascending colon, hepatic flexure and the right one-third of the transverse colon. It is apparent that two or three hours after a meal there is in the upright portion a considerable drag of the small intestine and the right portion of the transverse colon due to gravity. These patients are greatly benefited by the horizontal position or the knee chest position simulating the quadruped.

The veterinarian speaks of this area of the anatomy as the anterior and posterior mesenteric artery. The anterior mesenteric artery in the animal has a different direction. The acute angle made by the superior mesenteric artery with the abdominal aorta in man does not exist in the animal. Incidentally, the close proximity of the anterior mesenteric artery to the duodenum is the probable cause of the transmission of the trypanasome, Stronglyus vulgaris, into the artery causing a fatal aneurism of the anterior mesenteric artery. This is a common disease among

*Read before the Saint Paul Surgical Society, Saint Paul, Minnesota, October 10, 1940.

horses and mules in the tropics and to some extent in the temperate zone.

The technic of x-ray studies of the gastro-intestinal tract up to a few years ago has consisted in visualizing the barium column descending in the esophagus, its entrance into the stomach, the



Fig. 1. X-ray appearance of the duodenum before operation.

careful scrutiny of the stomach itself and then the pylorus and the first portion of the duodenum. Our interest as a rule ended here. Occasionally the following x-ray pictures would reveal a duodenal diverticulum but we missed the fluoroscopic visualiziation of the food column in the duodenum. As soon as there is reverse peristalsis in the pars horizontalis of the duodenum the patient experiences a nausea. Much of the nausea patients complain of may have its origin in the duodenum. Mal de mer, street car or train sickness may have reference to a mild degree of duodenal stasis. Mal de mer sufferers as a rule are able to partake of food and are fairly comfortable lying flat on their back in their cabin.

The duodenum which normally has the widest lumen of the small intestine takes on added lumen dimension and probably increased thickness of its wall in this condition. Normally the food column after its passage through the pylorus fills the duodenal cap where it pauses a few moments and then in rapid glides flows uninterrupted through the rest of the duodenum into the jejunum.

Pool et al.[6] stress the need for exacting fluoroscopic examination of the duodenum in all cases in which there is any suspicion of difficulty. They describe the phenomenon "producing an abnormal puddling and cradling of barium in the dependent loop."

In the preparation of a patient for duodeno-

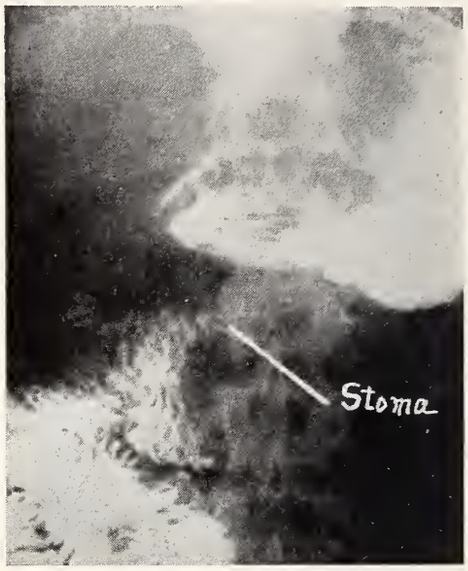


Fig. 2. X-ray appearance of the duodenum after operation.

jejunostomy, it is advisable that a duodenal suction tube be passed before the operation as usually the stomach in these cases is so ballooned that it adds to the difficulty of the operation on the duodenum.

As to harmful consequences, Portis[8] reports, "It is well known that if allowed to go unchecked, these changes may result in severe toxemia. These changes manifest themselves in a drop of the plasma chlorides, a shift in the acid-base balance and the non-protein nitrogen of the blood."

Water, glucose, alcohol, potassium chloride, and sodium chloride can be absorbed by the duodenum.[8]

The term "abdominal neurosis" is a condition which is often associated with temporary delay in the duodenum.[8]

Brown[2] feels that "the upright position of man has brought about the difficulty because in animals the duodenum hangs free on a mesentery."

Earl[3] reports good surgical results in patients who do not respond to medical regime.

Duodenal stasis has been found to be associated with duodenal ulcer. Medical care is advised by all authors, as a great many patients are sufficiently benefited to be able to continue

their work.[4,1] The medical regime consists of any one of the following: rest in bed in the supine position from four to six weeks, duodenal lavage and feeding, the knee chest posture after meals, elevation of the foot of the bed and a well fitting abdominal support.

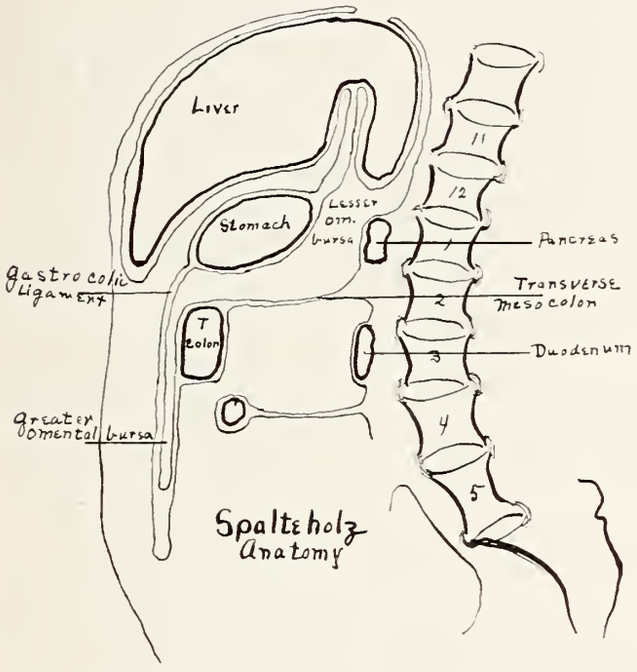


Fig. 3. Late embryonic stage of development of the omentum.

If the supine position does not produce results the prone position with a pillow support under the chest and pelvis, leaving the abdomen free, should be tried.

A variety of operations had been performed on a great many of these patients with no relief, indicating that the true condition had not been recognized.[7]

"The clinical symptoms are heaviness and fullness after eating, nausea, dizziness, a sea sickness, fatigue, headache, palpitation, irritability, insomnia and anxiety."[7]

Dr. Béla Halpert[5] of Prague has done some very extensive work on the anatomy and physiology of the duodenum and I shall borrow from him freely.

The detailed anatomical division of the duodenum is as follows: pars horizontalis superior from pylorus back and to the right; the flexura duodeni superior dextra; the pars descendens; the flexura duodeni inferior dextra; the pars horizontalis inferior; the flexura duodeni sinistra; the pars ascendens; and the flexura duodeni jejunalis.

The radix mesocolica divides the duodenum into pars superior and pars inferior. The radix mesenterii divides the duodenum into the pars dextra and pars sinistra.

The inferior pancreaticoduodenal artery and the median colic artery, as a rule, together with six jejunal arteries leave the superior mesenteric

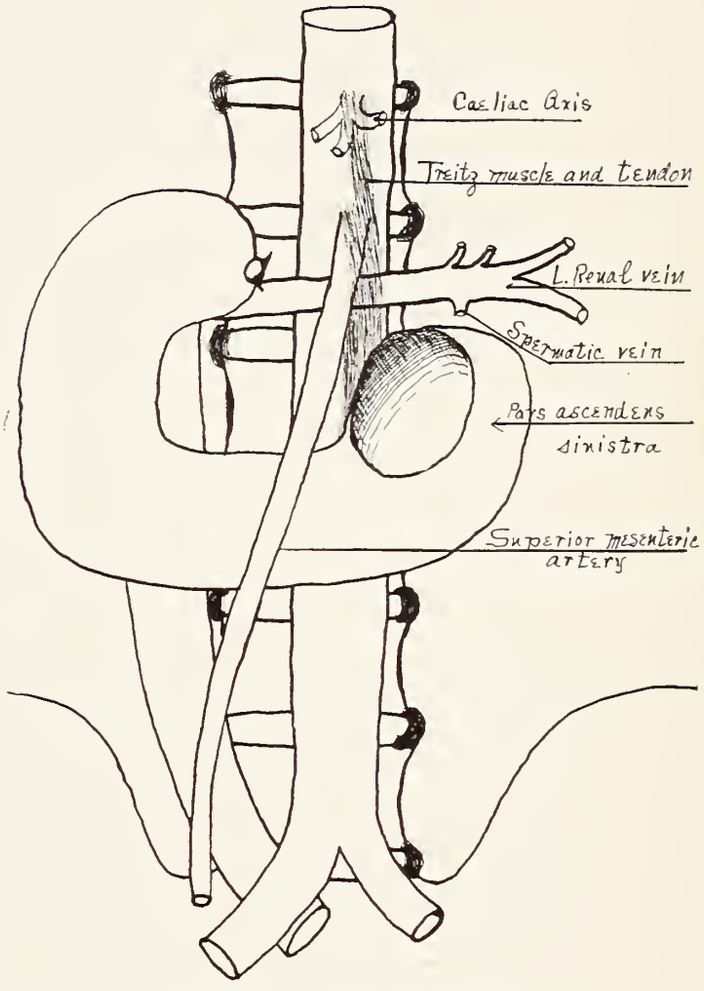


Fig. 4. Normal anatomy of the duodenum, left renal vein, artery superior mesenteric and ligament of Treitz.

before it comes to the point of duodenal compression. The mesenteric root containing the mesenteric vein and the now reduced mesenteric artery cross the distal horizontal portion of the duodenum where it crosses at the level of the body of the third lumbar vertebra.

Although the mesentery has a sufficient length to permit even normally the small intestine to rest in the pelvis, yet when there is a duodenal stasis present, we find that the mesentery of the small intestine lying in the pelvis following a meal exercises a sufficient pull to flatten the duodenum against the tense aorta.

The pars horizontalis inferior duodeni crosses the lumbar vertebræ at the level of the third lumbar while the superior mesenteric artery has its origin from the aorta at the level of the first

lumbar. As to the etiological factors of duodenal stasis, Halpert emphasizes the point that on the basis of a study of 300 autopsies he found that this condition can happen only when there are definite peritoneal abnormalities.

It is apparent that when a stretch is made on the mesentery of the small intestine, the angle of the superior mesenteric artery with the aorta becomes more acute. The direct pressure thus exercised would come first upon the left renal vein which occupies the very apex of the angle.

In these cases of duodenal stasis, Halpert also found an orthostatic albuminuria. The albumin would disappear with the patient in the horizontal position. He makes the observation that in the standing position the lumbar spine becomes more lordotic and together with the anatomical position of the renal vein in the acute angle of the superior mesenteric artery and aorta, plus the mesenteric drag in the standing position there is a compression of the left renal vein which produces passive venous congestion of the left kidney causing an albuminuria.

An erroneous diagnosis of nephritis can readily be made in such a patient. An orthostatic albuminuria could be used as an aid in the differential diagnosis of a high placed duodenal ileus.

Halpert has made further observations regarding anomalies:

1. There may be five renal veins on the left side.
2. There may be two veins, one passing in front and one behind the aorta.
3. Often the only left renal vein passes behind the aorta.

Sonne (quoted by Halpert) declares that inasmuch as the left renal vein is longer than the right and must pass over the aorta in the acute angle formed by the superior mesenteric artery and the aorta it must in addition pass over the lordotic lumbar spine and the thus constituted stasis of the kidney is the cause of the albuminuria.

Rieser (quoted by Halpert) is under the impression that orthostatic albuminuria is caused by compression of the left renal vein due to the fact that the superior mesenteric artery and the aorta act like a pincher upon the vein either because of a lordotic effect on the aorta or a tightening of the mesenteric cord.

Anatomically the right spermatic vein enters the vena cava directly. The left spermatic vein enters into the left renal vein. By the same process of compression causing stasis of the left kidney, we can also have the stasis extending into the spermatic or ovarian vein, causing a varicocele in the pampiniform plexus in the left scrotum or a varicose condition of the pampiniform plexus of the ovary on the left side.

In two case reports of acute dilatation of the stomach clinically diagnosed as pyloric stenosis, Halpert found at autopsy a hugely dilated stomach filled with fluid, and an overstretched pylorus with the duodenum equally tense up to the position where the superior mesenteric artery crosses it. The mesentery resembled a tense cord. A knot of small intestine lay deep in the right small pelvis. The small intestine was entirely empty up to the point where the superior mesenteric artery crossed the duodenum. At autopsy he experimented by lifting the knot of loops out of the pelvis, relaxing thereby the cord-like mesentery and immediately the impounded fluids rushed through the compression area and filled the, up to now, empty loops.

A typical picture of postoperative gastric dilatation, Halpert's first case had been diagnosed nephritis because there had been considerable albuminuria. But this was an orthostatic, lordotic albuminuria due to compression of the left renal vein which was pinched or compressed in the acute angle of the mesenteric artery and aorta. The abnormal course of the renal vein between the third lumbar vertebra and aorta, at the vertex of the lordotic curve of the lumbar vertebra, may also cause stasis of the left renal vein. In the horizontal position the lordotic curve is less, pressure is relieved and the stasis and albuminuria are corrected.

The superior mesenteric artery arises from the aorta at the level of the intervertebral disc between the first and second lumbar vertebrae. Immediately above this position is the celiac axis. Originating from these two first unpaired vessels of the abdominal aorta are tendonlike fibers passing downward with some muscle tissue, the Treitz muscle. The tendon fibers then spread out and attach themselves to the musculature of the pars ascendens duodeni. This causes the duodenum to be a fixed organ and there is no way that it could evade the pincher pressure of the mesenteric root.

Halpert recites the developmental peritoneal abnormalities as follows:

1. A high mobile cecum.
2. A short ascending colon.
3. A long transverse colon.
4. A long transverse mesocolon.
5. A deficient ligamentum hepatico colicum.
6. A second peritoneal attachment between liver and hepatic flexure.
7. A deep inferior omental recess due to a lack of union of the anterior with posterior surface of the greater omentum.

If these two peritoneal surfaces fail to unite, there is an absence of the gastrocolic ligament. The absence of this ligament together with the incomplete hepaticocolic ligament, which are the structural support of the colon, cause the transverse colon to sink deep into the lower abdomen. This brings about an increased pressure on the mass of small intestines.

Waldeyer (quoted by Halpert) points out that the transverse mesocolon, extending from the posterior abdominal wall to the tenia of the transverse colon, constitutes a partition between the upper and the lower abdomen, or divides the glandular abdomen from the intestinal abdomen.

The clinical case here reported represents a mild or moderate deviation from normal physiology. It helps to explain some of the types of nausea or sea sickness or car sickness which have no pathologic basis. Never shall I forget the comfort I once gained when suffering from mal de mer by lying supine and pillowless.

The cases described by Halpert are the advanced or completed picture which rapidly lead to a fatal issue.

Summary

1. A duodenojejunostomy corrected both clinically and radiographically the distressing symptoms due to a duodenal stasis.

2. In cases with peritoneal abnormalities there is a pinching or compression effect exerted upon the left renal vein and the pars horizontalis inferior duodeni by the superior mesenteric artery, mesenteric vein and mesenteric cord.

3. This is not a strangulation but a compression of the duodenum which causes a duodenal stasis. It may cause an acute dilatation of the stomach which may be fatal.

4. The same pressure on the left renal vein causes a left kidney congestion with orthostatic-lordotic albuminuria. Also it may cause a left-sided varicocele in man and left pampiniform varicosities in the ovary.

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A REPORT ON PROGRESS IN ADRENAL THERAPY*

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THE remarks I am about to make do not advance anything new or revolutionary on the subject but in them I shall attempt to review the late advances, and condense into form usable by the general practitioner knowledge which is not in general use. The subject was selected because of a severe case of Addison's disease which it has been the privilege of our group to follow and on which we have received aid and advice from Dr. E. L. Tuohy, and the Duluth Clinic staff.

Mrs. L. G., aged forty-eight, a cook at the farm school, had been seen by us at intervals since January, 1939. She is the mother of three children, the youngest twenty years old. She reported that when she carried him she had a severe influenza and after he was born she never menstruated again. There was

*From the Itasca Clinic, Grand Rapids, Minnesota. Read before the annual meeting of the Northern Minnesota Medical Association, Duluth, Minnesota, July 19, 1940.

no past history of tuberculosis or contact with anyone having it. Her Wassermann reaction was negative.

When we first saw her she complained of marked asthenia and tiredness especially severe in the morning but she had carried on her regular work. Her skin and mucous membranes demonstrated a mild but definite pigmentation which had come on very gradually but uniformly since 1935 but had at no time worried her or her family. She had no loss of weight.

Her previous life had been healthy except for periodic attacks of nausea and vomiting which had occurred once or twice each year for about twenty years. Various physicians had diagnosed these spells as food intolerance, indigestion, enteritis, gallbladder colic and iron deficiency.

Our general examination was entirely negative. Her blood pressure taken many times varied from 120 to 144 systolic and from 80 to 90 diastolic, her urine was negative, her blood picture was normal with a hemoglobin of 100 per cent and fasting blood sugar of 172. Her blood picture in 1935 taken elsewhere had been: Hgb. 75 per cent, r.b.c. 4,000,000, w.b.c. 14,400, but in the meantime she had taken ferrous sulphate intermittently.

We made no diagnosis. In May, 1939, she had a spell of marked nausea and vomiting, chills, fever and backache which lasted one day and when we saw her we were content to agree with her that some food indiscretion had upset her.

In November, 1939 her continued weakness led to a check-up by the Duluth Clinic and a diagnosis of Addison's disease. The positive symptoms were progressive asthenia, amenorrhea, pigmentation and syncopal gastric attacks. It is to be noted that normal blood pressure and maintenance of average body weight present in this case do not rule out Addison's. When one realizes that a patient with Addison's disease has often arrived at the autopsy table without any pigmentation at all or that pigmentation may occur five to six years before any physical symptoms appear and when normal blood pressure readings can persist long after the disease is active, one can appreciate the diagnostic pitfalls. It is interesting to note that at Duluth also her blood pressure was found normal, varying from 126 to 140 systolic. Her blood and urine examinations as already reported were normal. Several estimations of sodium chloride in the blood were made and these varied from 380 to 400 mgs. per cent The method of Dr. Wilder and associates for testing sodium chloride urinary excretion while the patient was on a high potassium intake was carried out. The findings were in keeping with the clinical manifestations, viz., whereas the sodium excretion dropped quite low it was not low enough at any time to institute clinical symptoms. The lowest blood pressure was 116 systolic. The diagnosis then rested principally on the asthenia and pigmentation.

The patient returned to us, remained on a high salt diet, was given plenty of extra vitamins and reported moderate improvement. Suddenly the afternoon of April 11, 1940, she became extremely ill with marked dyspnea, nausea, then severe vomiting, great weakness, headache and chills. When I saw her, the extreme dyspnea, chills and temperature of 102° made me wonder whether pneumonia was not impending. Palliative measures during the night failed and she was admitted to Itasca Hospital 8:30 a.m., April 12, 1940, and a diagnosis of crisis of Addison's disease was made, although her blood pressure still remained from 112 to 120 systolic.

Prior to 1922 and the advent of insulin the physician frequently sat by the bedside of a patient in diabetic coma and wondered if the day would ever come when medicine would conquer death from that case. On April 12 we stood beside a comatose patient with a normal blood sugar and urine suffering from an extreme Addisonian crisis and recalled the words of Dr. Roundtree in the Encyclopædia of Medicine of recent date—"Coma is not uncommon and recovery from it is rare. In many cases the last days of life are spent in what seems to be a restless sleep."

Without definite standards such as we now have in diabetes to guide us, we commenced intravenous medication, using normal saline and 10 per cent glucose with adrenal cortex extract, then more concentrated salt and more extract. Our patient became markedly cyanotic and her respirations assumed the Cheyne-Stokes type before we got any response and she started to rally.

In the first twenty-four hours she got 18 c.c. of adrenal cortex extract and twenty-six grams of salt intravenously plus adrenalin as a cardiac stimulant and 2,000 c.c. of 10 per cent glucose. She remained restless and at times delirious but always completely comatose.

The second twenty-four hours we gave 12 c.c. of adrenal cortex extract and twenty-seven and one-half grams of salt intravenously, continuing adrenalin and glucose as needed. During the afternoon of this day she seemed semi-conscious and aware of people about her.

The third twenty-four hours we gave her 13 c.c. of adrenal cortex extract and 37.5 grams of salt by intravenous route. Her respiration and pulse approached normal, toward the end of the night she became conscious and her general improvement was very similar to that of a patient recovering from a diabetic coma.

Each day after that we gave her 5 grams of salt plus as much as she could tolerate in her food with 9 c.c. of cortex extract the fourth day and 6 c.c. on the fifth and sixth days. Her recovery at this stage was without untoward event and she was discharged her eighth hospital day on 2 c.c. of cortex extract and about 5 grams of salt.

We had successfully brought our patient through her crisis. What of the future for her? In four days we had used adrenal cortex extract which cost thirty-two dollars. Such expensive treatment would make its continuous use prohibitive.

Fortunately biochemists have been at work.

There is now available a synthetic product which appears to furnish the essential hormone.

Let me first quote a brief historical sketch reported by Wilder:[4]

"In the course of the last ten years a successful major offensive has been made on a medical front which formerly seemed impregnable. The brunt of the campaign has been borne by investigators in the laboratories; the application of the advances made by them is the subject of the following account. The time is appropriate to review this past experience, because today, unless all signs fail, the knowledge and the means are at hand for a reasonably effective treatment of adrenocortical insufficiency, and until very recently, although steadily improving therapeutic results had been obtained, the disease defied us.

"Before 1930, when Swingle, Pfiffner and others provided active adrenocortical extracts, the mortality figures for Addison's disease were staggering. A few patients who were fortunate enough to have only partial destruction of adrenal tissue might live several years, but a large majority died within a few months and none could stand unusual stress of any kind.

"The extracts of adrenal cortex helped enormously. Patients in the shock-like state known as crisis, which before that time had almost always been a fatal event, could be restored to life. However, all such extracts were weak in activity and also frightfully expensive. The volume of material necessary was larger than could be given without great discomfort, and the cost, for any but the very rich, was prohibitive. Therefore, the ultimate results of treatment remained unsatisfactory, as Snell's report in 1934 made clear. On the basis of his data only seven of forty-six patients were alive more than a year after obtaining extracts.

"Then, in 1934, came the knowledge contributed by Loeb and confirmed by others, as well as our laboratories, that administering extra salt was beneficial, and soon thereafter the information came from several sources, that dogs maintained with salt after adrenalectomy excreted more sodium than chloride. If this was compensated for by giving mixtures of sodium chloride and sodium citrate, so as to provide more sodium than chloride, the patterns of electrolytes and concentration of urea in the plasma of adrenalectomized dogs remained normal.

"The clinical application of these facts was established promptly by observation of patients. It was found that they could be sustained more effectively than before, and with less adrenal extract, if they were given not only sodium chloride but also sodium citrate. We administered daily about 10 gms. of the former and 5 gms. of the latter. The salts were dissolved in a liter of water, artificial fruit flavoring was added and the solution was served iced under the inviting label of 'Addison's Elixir.'

"Another year passed, and the importance of controlling the intake of potassium was recognized by Allers, Nilson and Kendall. This information was applied in the hospital, where accumulating evidence soon revealed that as small an intake of potassium as 4 gms. a day, an amount no greater than that provided by general diet, would provoke excessive excretion of sodium and precipitate symptoms of Addison's crisis if patients were not receiving cortical extract. The same patients could be maintained with greater security than ever before and with still less, and in many cases no cortical extract, when the intake of potassium was limited to 2 gms.

"Administration of extra salt and sodium citrate and limitation of potassium greatly improved our clinical results, so that by July, 1937, Rynearson, Snell and Hausner could report that twenty-four of forty-three patients who received treatment between 1933 and 1937 were alive and in better condition than the surviving patients in the series reviewed by Snell in 1934. All of the individuals in the series reported in 1937 did not have the advantages of all the newer knowledge. Those that had died included many who had come to the Clinic before the diets low in potassium had been introduced.

"Results of the treatment of patients with Addison's disease continued to be as good as or better than those reported in 1937 until, early in 1939, when use of the crystalline preparation, desoxycorticosterone acetate, was begun at the Clinic. The brilliant work of Steiger and Reichstein made this available synthetically in 1938."

Since its discovery much therapeutic experimentation has been carried out by Thorn and Firor[3] at Baltimore; McCullagh[1] and Ryan at Cleveland and others using this synthetic crystalline cortical hormone which is manufactured by Schering under the trade name of Cortate and by Ciba as Percortin. This substance is now available in two forms: (1) in sesame oil for intramuscular injection where 1 c.c. represents 5 mgs. of desoxycorticosterone acetate; and (2) in pellets for subcutaneous implantation, each pellet containing 125 to 150 mgs. of the hormone and permitting an absorption of .25 to .35 mgs. daily.

The Baltimore men now have a good series of cases in which they have used the implantation method, putting from two to sixteen pellets under the skin after standardizing the patient on 4 to 8 gms. of sodium chloride daily plus a maintainence hypodermic dose of the hormone in oil. The Cleveland men have utilized the hypodermic method in all but one case and they seem to feel that they are getting a satisfactory response in a smaller number of cases using substantially the same amount of added salt daily.

In the case of our patient we obtained from Schering through Dr. Stoner three 150-mgm.

pellets of this experimental cortate and following the Baltimore technic implanted one pellet in the subcutaneous tissue of the infra scapular region. Eight days later, because the patient complained of the chair and her clothes rubbing it, I removed the pellet and replaced it together with a second one under the skin of her anterior abdominal wall. She is having no trouble now and, taking about 3 gms. of added salt daily, is doing her daily work as cook.

In the *Journal of the American Medical Association* for June 29, 1940, there are three articles, the Baltimore and Cleveland ones referred to above and one by Dr. Rowntree[2], now of Philadelphia, who reports six cases successfully treated exclusively with a non-commercial extract of the adrenal cortex, ignoring entirely the synthetic hormone. His final paragraph states:

"To me, whose experience with Addison's disease has been unusually large, these results represent the best I have seen to date. In years gone by, the care of patients with Addison's disease was fraught with constant anxiety. Formerly, patients were more or less continuously in a crisis, while now they are active, ambulatory, in moderately good health and going about attending to their daily business. In this series of patients crises have been prevented to a large extent and control of the hormonal deficiency has been effective. No toxic effects from treatment have been noted at any time in any of these patients, and local irritation has been entirely lacking. With the regimen outlined, the disease has been greatly ameliorated; remissions have been prolonged, complications rare and crises decreased in frequency and severity; rehabilitation has been striking and the survival time markedly increased. The last six consecutive patients on this regimen have averaged almost seven years of survival no deaths. From these results it is evident that true and nearly five years under this form of treatment with progress has been made in the treatment of Addison's disease."

That is fine except that as general practitioners we do not have available to us such non-commercial extracts and our patients have not the means to purchase them commercially.

Thorn and Firor, in their article, have the accompanying table showing the approximate cost of a year's medication.

At the price paid for cortical extract by our patient, 8 c.c. of the aqueous cortical extract per day would run to $1,170.00 for a year's treatment. That cost alone would seem to make Rowntree's method of treatment prohibitive in Addison's disease.

Preparation	Daily Requirement	Cost Per Year
Aqueous adrenal cortex extract	8 c.c.	$900.00
Synthetic compound in oil	2.6 mgs.	140.00
Pellets of synthetic compound	1.8 mgs.	98.00

Desoxycorticosterone acetate in oil does not exert its maximum effect until six to twelve hours following intramuscular injection. Therefore during the coma and the severe portion of the crisis it is necessary to supplement the synthetic hormone with intravenous and subcutaneous aqueous extract. For prolonged treatment one is forced to look elsewhere but before leaving the subject it should be reported that the natural extract has distinct uses in certain acute conditions such as toxemias of pregnancy, the acute toxemia of burns, in surgical shock and as pre- and postoperative treatment where stormy courses are expected or encountered.

A careful study of the cases reported by both the Baltimore and Cleveland groups indicates that use of the synthetic hormone is positively indicated in patients with Addison's disease who are unable to resume normal activity when treated with adequate quantities of sodium chloride and sodium citrate plus a diet low in potassium.

Thorn and Firor state:

"Desoxycorticosterone acetate is one of several crystalline substances isolated so far from adrenal cortical extracts. It is by no means certain that any one of the compounds thus far isolated represents the active form of the naturally occurring hormone. As tested by its potency in maintaining the life of adrenalectomized animals desoxycorticosterone is the most active of all the compounds thus far identified. . . . It is to date the only compound which has been synthesized and the only crystalline compound which can be obtained in quantities for clinical trial. It is evident that the quantity of supplementary sodium chloride administered to such patients must be carefully regulated during treatment with desoxycorticosterone acetate. Excessive quantities of the synthetic adrenal cortical principle and sodium chloride may result in the appearance of edema, hypertension and in some instances, signs of congestive heart failure. Occasionally the appearance of edema and excessive rise in blood pressure may necessitate a reduction in the dose of desoxycorticosterone acetate before the maximum therapeutic effect has been attained. Since the great increase in blood volume, the rise in blood pressure and the increased physical activity which follow the

institution of treatment with the synthetic compound rather suddenly place a considerable additional load on the cardiovascular system, it is advisable to restore most patients rather slowly to normal activity. The grave nature of the possible complications indicates the need for care in the institution of treatment and the necessity for continued medical supervision."

The same authors, concluding a report of continued and striking clinical improvement in twenty-one out of thirty cases treated by the pellet implantation method, state:

"Treatment with the synthetic adrenal cortical principle appears to be an efficacious form of specific therapy for patients with Addison's disease. The uniform potency and stability of the crystalline product permit more exact regulation of therapy. The relative inexpensiveness of treatment with desoxycorticosterone acetate will permit most patients to afford adequate therapy."

McCullagh and Ryan conclude their report on their six cases treated hypodermically with the following statement:

"Evidence is presented which indicates that desoxycorticosterone does not yield complete adrenal cortical replacement. In view of this, we feel that for the present, at least, it is in the best interest of the patient not to depend on desoxycorticosterone as therapy in Addison's disease to the exclusion of adrenal cortex extract in the presence of crisis or if some symptoms remain uncontrolled."

It is our opinion that marked progress has been made in adrenal therapy. The general practitioner can with advantage use both the extract and the synthetic hormone in certain acute toxemias and operative procedures. Where marked hypo-adrenia is noted by definite symptoms or where Addison's disease has appeared we now have at hand new therapeutic agents of proven efficacy and value. The practitioner may now feel that like diabetes, Addison's disease is losing its battle with medical progress and he should avail himself of both the natural and synthetic hormones and use them intelligently in conjunction with adequate sodium and reduced potassium intake in the treatment of all clinical conditions associated with hypo-adrenia.

Addenda

After the above report was written the patient continued on a high salt low potassium intake. The absorption of the hormone from the pellets did not seem to be quite sufficient to maintain her general well-being. However, irregular doses of 5 mgs. of Cortate intramuscularly made her feel fine and prevented any crisis.

Early in November, Schering again provided us with some pellets and we planted six, each weighing 150 mgs. in the anterior abdominal wall. These gave a theoretical absorption of .35 mgs. each or 2.10 mgs. per day for the six. The patient looked and felt well and except for occasional mild nausea was symptom-free. Her pigmentation was about as before and her blood pressure stayed about 140/80.

On January 5, 1941, she arose as usual, prepared breakfast and enjoyed it with her family. An hour later she went to her bed, lay down, told her husband she was nauseated and a moment later was dead.

At post mortem we recovered the pellets and checking their weight found that from them we had an absorption of 5 mgs. per day.

The post mortem examination of adrenal tissue showed that only 3 gms. remained instead of the normal 11 to 14 gms. Dr. George Berdez, pathologist, St. Mary's Hospital, Duluth, Minnesota, reported microscopic sections as follows:

"The cortical layers are completely atrophic and replaced by fibrous tissue in some area; in other areas, what is left of the cortex is densely and diffusely infiltrated with lymphocytes and shows also small groups of giant cells, some of them similar to those seen in tuberculous processes; there are, however, no tubercles and the arrangement of those giant cells would rather suggest that some of them are foreign body giant cells taking up debris of the breaking down tissues; other of those giant cells are the result of repeated nuclear division in reticulo-endothelial cells stimulated by the inflammatory process. Marked degenerated cells of the cortex, sometimes in small groups, sometimes isolated, can still be recognized in places. The cytoplasma of those cells stains diffusely red, is often finely granular. Frequently the nuclei do not stain. The medullary substance is also atropic and infiltrated with lymphocytes. In sections stained with scarlet red, small groups of cells of the cortex can still be recognized; some of those cells of the cortex are still loaded with granules staining red with scarlet red."

Our final conclusion in this case is that desoxycorticosterone acetate is of considerable value in preventing crises and in this case apparently gave our patient several months of life she would not have had without it. We believe more work will have to be done to determine the exact amount of daily absorption the individual obtains per 100 mgs. of implanted pellets. In addition we will have to develop some method of estimating more accurately the actual dosage required daily. The accurate required daily dosage of insulin can be established irrespective of the amount of destruction of the islands of Langerhans. In Addison's disease we apparently lack any criterion except the well-being of the patient.

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INCISIONAL HERNIA AND ITS REPAIR*

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ABDOMINAL operations are often performed in the easiest and quickest way possible to relieve the patient of the immediate trouble without due consideration of the ultimate results of the operation.

One of the complaints after a laparotomy may be an incisional hernia and, judging from the literature and records examined, I believe too many occur that could have been prevented had the operator taken into consideration all of the causative factors of incisional hernia.

The results of operations for these incisional hernias are none too satisfactory. These hernias usually occur in fleshy persons, especially women, in whom a hernia is not noticed by the patient at once inasmuch as most of them have been wearing a corset or abdominal support. The symptoms at first are vague and mild; the individual becomes used to the discomfort and the hernia develops so insidiously that the advice of a physician is not sought until the mass becomes so large that it is noticeable and unsightly, the suffering becomes severe, or obstruction of the bowel occurs.

The rate of occurrence of postoperative incisional hernias is difficult to determine, for usually only those that give trouble are seen and some others are observed in connection with more distressing maladies.

Some of these so-called postoperative hernias are simply a stretching or thinning out of the muscle because of the nerve injury at the primary operation.

Masson[5] reports 2.6 per cent of incisional hernias in all abdominal operations, or 14.66 per cent of all hernias. Mohorner[6] reports twenty-four incisional hernias in 112,686 cases admitted to the New Orleans Charity Hospital in 1937 and 1938. Hartzell and Winfield,[4] in a review of the literature, conclude that wound disruption occurs in about 1.5 per cent of cases and may be due to vitamin C deficiency. Cave,[1] in eleven years at Roosevelt Hospital, found 6.02 per cent of all hernias were incisional and 2.2 per cent incisional hernias occurring in 5,366 abdominal operations; and, in 162 drained appendices operated by McBurney's incision, twenty-one hernias developed.

Singleton and Blocker[8] state that hematoma and infection in 1,924 cases, reviewed by Jenkins, resulted in incisional hernia in 22 per cent. In reviewing 9,000 consecutive abdominal incisions, they report infection in sixty cases.

Infection of an abdominal wound is conceded by most surgeons as a potent causative factor in incisional hernias, especially if there is sloughing of the fascia. Abdominal operations for the drainage of abscess cavities, diseased gall bladders or ruptured appendices frequently are followed by incisional hernias.

I have observed that it is often possible to shorten the healing and convalescence periods in patients being drained for an abdominal abscess, by turning them over on the abdomen and allowing the pus to gravitate outward.

Rhodes and Hatterstein[7] conclude from experiments that tanned iodized catgut is the best suture material to use. Many surgeons prefer fine silk for the fascia, but I have been satisfied with chromic No. 1 or 00 with supplementary tension sutures.

When possible, the median incision is chosen in order to avoid injury to the blood and nerve supply: but, in potential hernia cases, the rectus may be pulled to one side and the peritoneum opened back of the muscle instead of in the center. However, care should be taken not to injure the deep epigastric vessel, for, as noted by Thos. C. Cullen,[2] "hemorrhage into and beneath the rectus muscle may seriously complicate the operation." I think this happens occasionally and results in an abscess weakening the abdominal wall. Sloan[9] believes that by using physiological incisions all incisional hernias can be eliminated except those caused by drains.

Incisions in the lateral abdominal wall are made in the line of the nerve supply when possible. If the main motor nerve to the muscle is injured there is apt to be insufficient tone and strength to these tissues and a weakened abdominal wall, with bulging or a real hernia occurring. The main blood vessels and nerve to the

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various layers of the abdomen should be conserved, if possible, in order to promote healing.

The peritoneum is often very thin or has a great deal of fat superimposed. A careless, hasty and imperfect closure of the peritoneum invites a postoperative hernia especially if the posterior sheath of the rectus muscle is not also carefully sewed.

Self-retaining wire retractors, as well as crushing forceps, may cause injury to the peritoneum and imperfect healing at these points. It has been my habit to avoid undue trauma or pressure to the peritoneum and to close the peritoneal membrane by suturing back and forth through its everted edges (Fig. 1-A). This gives a firm closure with a smooth inner surface and when a sufficient amount of tissue has been included there is little chance of a gap remaining in the peritoneal suture line. This is especially so when a second suture is run along the edges of the peritoneum and another along the fascial layer (Fig. 1-B). Dermal mattress sutures are also used, passed through the cut edges of the fascia, skin, and through rubber tubing and loosely tied. They relieve the strain on the other sutures and firmly hold the tissues so that oozing and consequent infection is less likely. Any exudate is evacuated by small drains extending through the skin to the fascia. The stay sutures may be left in for fourteen to twenty days. Subcuticular sutures for the fat layer are unnecessary when stay sutures are used.

There is no question but that minimizing intra-abdominal pressure lessens the possibility of hernia, and, therefore, nasal suction is always employed on the least indication of distention or vomiting, and the rectal tube for colonic gases. Additional essential vitamins are supplied, and transfusions are given when necessary. Food is given as tolerated.

The preliminary care of patients to be operated upon for incisional hernia is more essential than at the primary operation.

The patient should be sent to the hospital and kept there until the hernia is reduced, if possible. In order to determine more accurately the status of the case, a flat plate of the abdomen should be taken, and, in some instances, a barium enema and radiograph taken. Nasal suction will empty the stomach and intestines above any obstruction, and the colon should be emptied from below. In case of anemia, transfusions can be given. Heart complications should be studied, and pulmonary and laryngeal disturbances should be combatted.

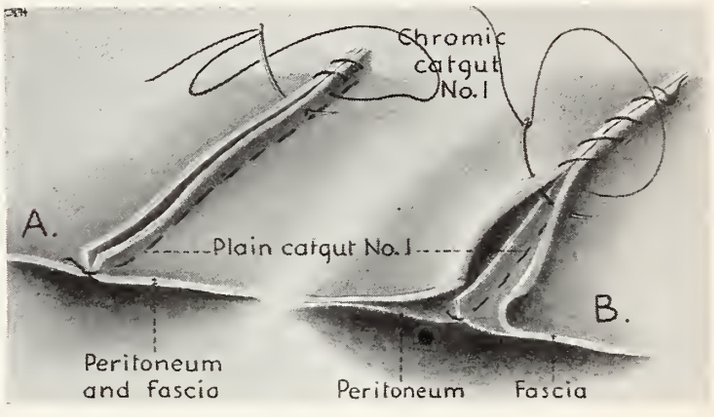


Fig. 1. Peritoneum everted, with suture lines.

Operation for Postoperative Hernia

A preliminary hypodermic of morphin and atrophin is given and local anesthetic used as a rule. The incision is transverse or perpendicular according to the size and location of the hernia, and should be sufficiently extensive to allow exploration for possible multiple hernias which are frequently present after a midline incision.

Where it is possible to separate the peritoneum from the fascia it is closed by an overlapping method with catgut. In cases with fairly good muscle structure, the sheaths are incised and apposed in two rows, making muscle approximation more perfect.

When the hernia is small, no doubt the transverse incision is best, and the flaps are overlapped as in the Mayo operation. This method overcomes the lateral pull of the abdominal muscles on the suture line, and should be chosen where possible.

Where the peritoneum is not easily separated from the fascia, the fascia and peritoneum and any thin muscle structure present are thoroughly separated from the fat and overlying skin. When the intestines are not distended with gas, these tissues may be overlapped laterally, the underlying peritoneal layer and fascial flap are stitched to the peritoneum on the opposite side with chromic catgut No. 1 (Fig. 2-A). Stay sutures are then passed through the skin from the side where overlapping occurs, through the upper flap and the fascia of the underlying flap and brought back through these tissues as a mattress suture. A row of these interrupted mattress su-

tures is placed along the abdominal wall. A second line of continuous sutures of chromic catgut, No. 0, doubled, fastens the edge of the upper flap to the fascia of the lower flap. This secures the two flaps firmly together and makes an impenetrable wall excepting, of course, in such cases where there is insufficient fascial tissue to make this operation possible. Under such circumstances a less extensive imbrication may be done and in some instances a pedicle flap of fascia is dissected from nearby tissue and turned in to complete this defect (Fig. 3). However, I have found few cases where this is necessary if the preliminary treatment has been carried on long enough to reduce the hernia and overcome some of the obesity and tension. In some instances it is necessary to put additional sutures along the flaps to secure them firmly.

The mattress sutures are tied over a long roll of gauze outside the skin which distributes the pressure, prevents the cutting in (Fig. 2-b) of sutures, gives a somewhat elastic tension upon the secured tissues, makes a broader surface of approximation of the structures, and lessens the possibility of hemorrhage, oozing, and infection. Each bleeding point is securely controlled and a few strands of catgut or small flat rubber drains are loosely placed through the skin line of incision to carry off any serous or bloody exudate that may occur beneath the skin. This system I employ in all other hernia operations. It gives excellent results.

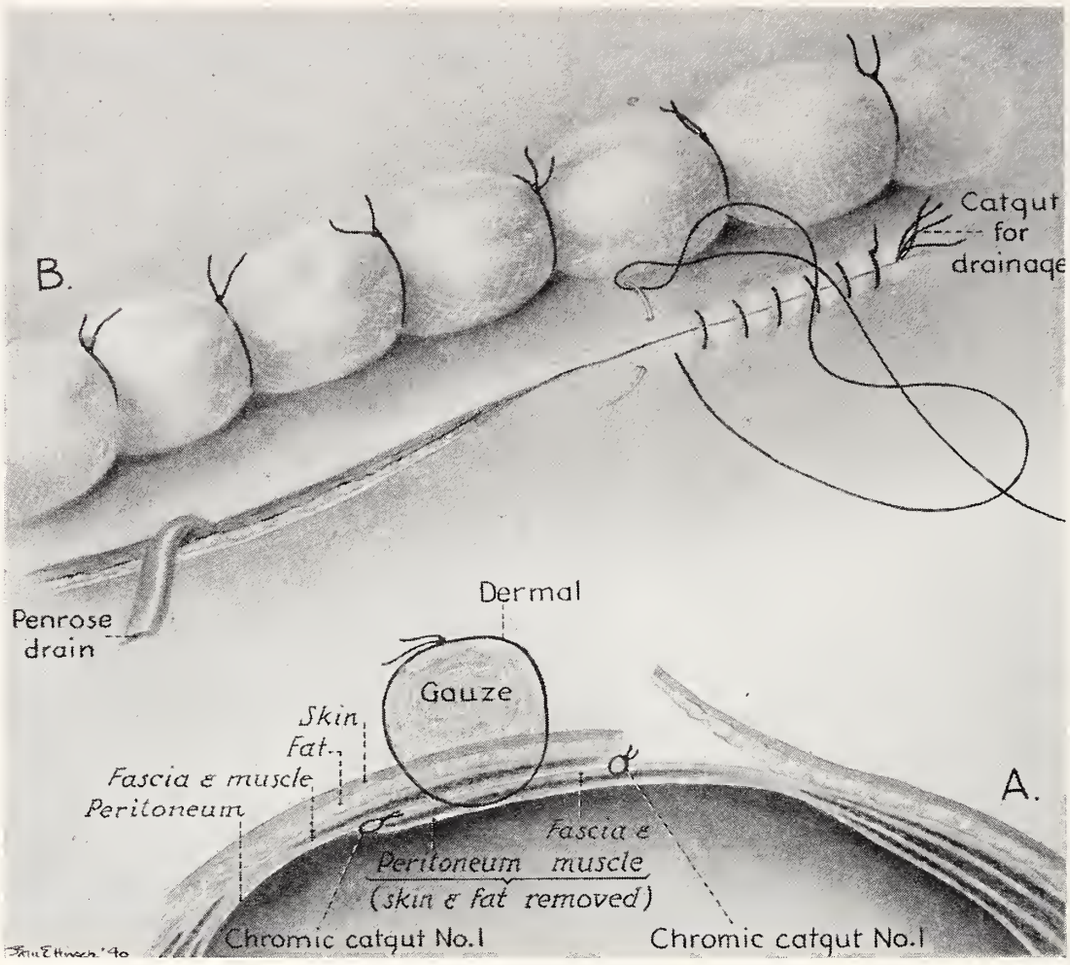


Fig. 2. Repair of postoperative hernia. Mattress sutures over roll of gauze on skin.

We have not used the Gallie[3] fascial strip to lace in and through the approximated structures, though we would not hesitate to do so if necessary. We have used the fascial flap. The extra time consumed and the added danger of infection makes this fascial strip operation more hazardous, however.

Smith and Masson[10] conclude that ventral hernias which they have not been able to repair previously can be repaired with sutures of fascia lata.

The lateral pull of the abdominal muscles may account for some recurrences. They should be immobilized as much as possible by abdominal adhesive strips and a binder directly following the operation. It is well to apply these strips after the wound is healed and left supporting

the abdomen for several weeks, but an abdominal support should also be properly fitted and worn for months thereafter. Tone and strength of the abdominal muscles should be restored by systematic daily exercises.

The rate of recurrences is variously estimated, but averages about 36 per cent. This percentage can and should be reduced.

The following is a summary of the records of a series of seventy-seven cases of incisional hernias studied at the University of Minnesota Hospital.

The ages ranged between twenty-two and seventy-eight years; forty-three were females and thirty-four males.

Forty-six were operated upon for repair of the incisional hernia; thirty-one were not. Of the forty-six patients operated upon, twenty-four were by the lateral overlap method, three by the Mayo method, and six by the direct method.

Of the forty-six patients operated upon, twenty-seven had complications, namely, gallbladder, appendicitis, pelvic tumors, or diabetes, heart or kidney trouble. One patient died in this group, a mortality rate of 2.9 per cent.

Of the thirty-one not operated, most had complications more serious than the hernia, so operation was deferred.

Of the forty-six operations, the immediate results were satisfactory in thirty. The ultimate results we were not able to determine from the chart records as many did not return for a checkup. In 9 cases (20 per cent), the results were poor.

The primary operations, followed by the hernias, were: nine appendectomies with drainage, three for gallbladder, and the others were for pelvic tumors, tubal trouble, etc.

In a similar summary of 125 cases at Minneapolis General Hospital, we found:

The ages ranged from ten to eighty-two years. There were sixty females and sixty-five males.

Fifty-three patients were operated upon for repair of the hernia. Seventy-two were not operated upon, because of other serious or more important disorders.

Of the fifty-three operations, thirty-two were by the overlapping lateral method, one by the Mayo method, twelve by direct approximation, one by incision of recti sheaths, one by using a Gallie fascial strip, and three a fascial flap.

Of the fifty-three patients operated upon, one died, a mortality of 1.8 per cent. All the other patients operated upon were improved when discharged but the percentage of recurrences is difficult to estimate as few returned for a checkup.

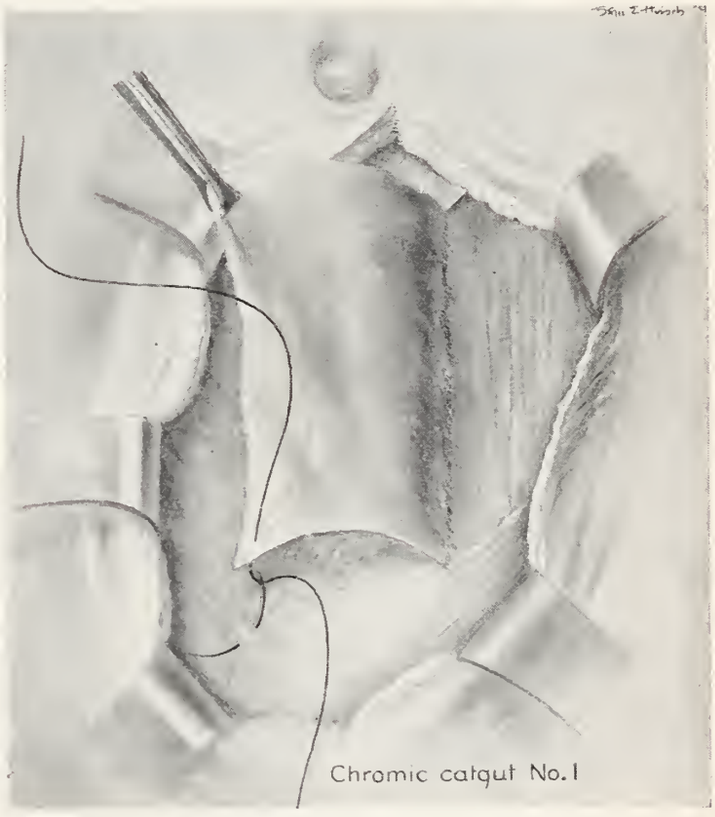


Fig. 3. Fascial flap repair of postoperative hernia.

The primary operations which were followed by hernia were: twenty-seven appendectomies (21.6 per cent); fourteen gall-bladder operations (11.2 per cent); and the others were hysterectomies, tumors, ulcers, et cetera.

In a series of fifty-five private cases of postoperative abdominal incisional hernias, there were forty females and fifteen males. Thirty-one females were operated upon for repair of the hernia; nine had either small non-disturbing hernias or associated diseases more troublesome than the hernia. In those operated upon, the results were good, excepting two who each had a small recurrence. These were in obese women who had inadequate support at first, but have little trouble with the hernia now.

Of the fifteen males, all were operated upon except two, who have very little trouble with the hernia. The results were good in all those operated upon and there were no recurrences in this group.

Of the forty-four patients operated upon, the cause of the hernias in twenty-one cases was acute appendicitis with prolonged drainage, where

the patients were not turned over on the abdomen after operation. In nine instances the previous operation was for gall-bladder disease with drainage. In twelve cases a low median incision had previously been made for operations on the pelvic organs in rather obese women and drains employed in three cases. One of these patients weighed three hundred and thirty pounds. There was inadequate support in most of these cases following the primary operation. The remaining hernias followed operations for carcinoma of the colon.

The direct apposition of structures with imbrication of the external fascia was done in seven cases. The Mayo operation was performed in three cases. In all others there was an overlapping of the opposing structures in layers when possible, or when inseparable as a single flap, supplemented by a contiguous fascial flap in two cases. These overlapped structures were united with chromic catgut No. 1 or 0, doubled, and stay sutures tied over rolls of gauze or rubber tubing. Drainage through the skin was secured by small catgut strands or small flat rubber drains.

Whenever possible, the hernial sac was carefully dissected to within the abdomen and was secured to the inner abdominal wall opposite firm abdominal wall tissue where feasible.

In this series of private patients operated upon for repair of the hernia, there was a recurrence of 4.6 per cent and no mortality, but in all of them we were able to prepare the patient for the operation, except in two cases where there was an obstruction so severe that an immediate operation was performed. Some of these patients were advanced in years and had little resistance; others were operated upon for some associated trouble as well.

Two died of cancer of the colon a year later. Four have thin walls and some pain and might have a recurrence if no support were worn.

We may attribute the success of this work to: (1) the time permitted for preparation of the patient for an operation, (2) the use of local anesthesia in most cases; (3) the employment of nasal suction when necessary; and (4) the fixation of tissues by means of the stay sutures tied over gauze rolls or rubber tubing which makes a broader apposition, lessens bleeding, and prevents cutting of sutures.

Conclusions

1. The incidence of incisional hernias following abdominal operations is greater than it should be, and is more than most records show.

2. Surgeons should conserve nerve and blood supply and give more thought to the possibility of hernia following a primary laparotomy in order to prevent such an occurrence.

3. Essential vitamins and blood transfusions when indicated should be supplied at the primary operation.

4. The preparatory treatment for an incisional hernia operation is very important.

5. The general condition of the patient should be satisfactory and, except in emergency cases, the hernia should be reduced before operation.

6. The incision for a cure of incisional hernia should be adequate to permit the correction of any obstruction to the bowel, and proper identification of the tissues and all openings.

7. A small single hernia may be repaired by the Mayo method, but a large single or multiple hernia should be corrected by lateral overlapping of tissue with the addition of fascial flap or Gallie's fascial strip where necessary.

8. The mattress Dermol suture has proven most satisfactory in holding the supportive flaps together, when tied over rolls of gauze or rubber tubing on the skin and should be left in place for two to three weeks.

9. Very small rubber or catgut strands give ample drainage of subcutaneous areas.

10. The nasal suction tube should be used in most of these cases for two to four days.

11. Snug adhesive bands should be applied directly following the operation, and a well-fitting abdominal support worn constantly for several months after these operations.

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DERMATITIS MEDICAMENTOSA
A Teaching Summary*

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BY "dermatitis medicamentosa" is meant an eruption which occurs in a sensitized individual following the absorption and dissemination of drugs. The term "drugs" includes medicaments in general, simple or complex materials which act through the whole molecule or a particular split product. The portal of entry may be the skin, by means of contact or inunction (iodine, mercurials, procaine, quinine), the gastro-intestinal tract, by means of the mouth or rectum (phenolphthalein, barbiturate derivatives, atropine), the deeper tissues, by means of parenteral injection (salicylates, gold salts, arsphenamine), or rarely, the respiratory system, by means of inhalation (ipecac, belladonna, pyrethrum). Drug eruptions are primarily allergic in nature, but not altogether so. Although the skin and mucous membranes are the chief sites of attack, untoward reactions may appear in other tissues, such as the liver, the hematopoietic system, or the vascular network of the gastro-intestinal tract, the genito-urinary tract or the brain.

So that the nature of drug eruptions and their allergic features may be understood, it may be well to emphasize herein a few distinctive points in summary.

The Patient

Concerning the rôle of the patient, it may be said that:

1. Drug eruptions are relatively rare.

2. Such eruptions are acquired reactions of idiosyncrasy occurring in certain predisposed individuals.

3. The mechanism of sensitization of such individuals is little known. Experimentally, the skin of man and animals can be sensitized to certain chemicals (mercury, orthoform, salicylates, arsphenamine, formaldehyde, extract of primulin or rhus and others).

4. Sensitivity of the individual is achieved after a variable period of incubation. This period may range in duration from days to years, depending on the nature of the drug, the dose, the frequency of exposure, and most of all, the degree of susceptibility of the individual. A tolerance of years may be interrupted suddenly by the occurrence of symptoms of sensitivity.

5. Once acquired, the state of sensitivity is usually permanent, although the clinical reactions may vary in character and intensity from time to time.

6. No circulating reagins can be demonstrated by passive transfer.

The Drug

Concerning the rôle of the drug in this condition, it may be said that:

1. No drug is free from sensitizing properties, although there is considerable variation among drugs in this respect. For example, some of the well-known drugs may be classed as in Table I.

2. Drug eruptions are distinct from the pharmacologic or toxicologic effects of drugs. Cumulative effects of drugs are not observed (except perhaps in the case of bromoderma and argyria). Graded doses of drugs do not precipitate reactions of equivalent degrees. Drug eruptions have no counterpart which can be measured on animals in the experimental laboratory.

3. It is commonly thought that the dose needed to precipitate a drug eruption must be higher than the usual therapeutic dose, but this is not so. If an individual is sensitive to a particular drug, even a trace of that drug may be sufficient to provoke the eruption.

4. Reactions of sensitivity may be limited specifically to a group of similar drugs, to a single drug, or to a particular chemical fraction of a drug.

5. The degree of chemical purity of a drug is not a factor in the production of drug eruptions.

6. Sensitizing drugs are often concealed in proprietary products (quinine in certain anodynes, phenolphthalein in cathartic agents or bile salts, acetanilid in certain commercial preparations for relief of headache and other pains).

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*From the Section on Dermatology and Syphilology, The Mayo Clinic, Rochester, Minnesota. Read before Center for Continuation Study, University of Minnesota, Minneapolis, Minnesota, July 30, 1940.

The Reaction

Concerning the reaction, it may be said that:

1. Drug eruptions appear in unusual patterns, the nature of which is influenced by the type of drug that is concerned, the reactive capacity of the individual and the quality of his skin.

2. Reactions are usually unexpected, with an abrupt onset.

3. Constitutional symptoms, as a rule, are mild. However, in severe reactions fever, malaise, bleeding and death may occur.

4. The character of the eruption is sometimes distinctive for certain drugs (bromide, iodide, phenolphthalein); more often it is not. These eruptions must be distinguished from the contagious exanthems and from such common diseases of the skin as pityriasis rosea, secondary syphilis, urticaria and eczema. In the condition under discussion there is such a wide diversity of cutaneous manifestations that a proper dermatologic background is required if the physician is to arrive at the correct diagnosis.

5. Sensitization may be epidermal, in which case the reaction will be eczematous in nature, as in contact dermatitis as caused by mercurials, procaine hydrochloride, quinine, solutions of formaldehyde and others.

6. Sensitization may occur in the cutis (the vascular network ?), in which case a symmetrical eruption will appear, chiefly urticarial in nature, but presenting at times all the forms of elemental lesions of the skin, including purpura. Often combinations of the above occur on various occasions.

7. The mucous membranes of the mouth, genitalia and perianal regions are frequently involved. Some eruptions referable to drugs, such as phenolphthalein, show a predilection for mucocutaneous junctions.

8. A not uncommon form of reaction is the "fixed drug eruption" in which there is focal sensitization of the vascular network underlying a circumscribed site in the skin. Multiple sites may be so affected, and these sites may include the mucous surfaces. On occasions, when the offending drug is brought by the circulation to these particular regions, a characteristic flare results with spreading erythema, edema, pruritus and finally pigmentation. Bullæ sometimes form. Certain drugs possess the power of producing reactions in the form of fixed eruptions. The most common of these are phenolphthalein, arsphenamine, antipyrine, aminopyrine, acetophenetidin and barbiturate drugs.

9. The diagnostic value of cutaneous tests (performed by the patch technic), in proving the

TABLE I. SENSITIZING CAPACITY OF COMMON DRUGS

Relatively innocuous	Moderate sensitizers	Potent sensitizers
Aluminum salts	Acetanilid	Arsphenamine group
Bismuth salts	Acetylsalicylic acid	Barbiturates
Boric acid	Antipyrine	Bromides
Cod liver oil	Arsenic	Iodides
Digitalis	Atropine	Gold salts
Ether	Cinchophen	Mercurials
Magnesium salts	Codeine	Quinine
	Morphine	Sulfamido group
	Phenolphthalein	Dyes
	Salicylates	
	Silver salts	

TABLE II. DRUGS, CUTANEOUS REACTIONS THEY PRODUCE, AND DISEASES THE REACTIONS SIMULATE

Drug	Nature of reaction caused	Resemblance to
Arsenic	Pruritic Erythematous Urticarial Eczematous Desquamative Palmar and plantar keratotic Spotted pigmented	Scarlatina Erythema muliforme Eczema Keratosis hereditaria Addison's disease
Arsenobenzol (arsphenamine)	Pruritic Urticarial Erythematous Papular Papulosquamous Exfoliative dermatitic Purpuric Fixed eruptive	Urticaria Erythema multiforme Morbilli Pityriasis rosea Erythroderma maligna Blood dyscrasia
Acetanilid	Erythematous Cyanotic, with methemoglobinemia	Scarlatina Cardiac disease
Antipyrine	Papular Fixed eruptive	Morbilli
Atropine	Eczematous (local) Erythematous	Contact dermatitis Scarlatina
Acetylsalicylic acid	Erythematous	Scarlatina
Barbiturates	Erythematous Papular Bullous Fixed eruptive	Scarlatina Morbilli Erythema multiforme
Bromides	Pustular Fungating	Acne Blastomycosis Tuberculosis verrucosa
Iodides	Rhinorrheic Cervical adenitic Same as reaction caused by bromides	Coryza
Mercury	Eczematous (local or general) Erythematous	Contact dermatitis Scarlatina
Phenolphthalein	Urticarial Fixed eruptive	Urticaria
Quinine	Eczematous (local or general) Erythematous Bullous	Contact dermatitis Scarlatina Erythema multiforme
Salicylates	Erythematous Papular Bullous	Scarlatina Morbilli Erythema multiforme
Silver	Slate gray pigmented	Cyanosis
Sulfamido group	Erythematous Urticarial Papular Purpuric Photosensitive	Scarlatina Erythema multiforme Morbilli Blood dyscrasia

nature of the offending agent, is limited to a few conditions, chiefly those in which the drug produces an eczematous reaction. Drugs concerned are atropine, arsphenamine(?), chloral hydrate, dyes, solutions of formaldehyde, iodine, iodoform, mercury, quinine, turpentine and the group of local anesthetic agents.

10. Common cutaneous reactions to some familiar drugs are presented in Table II, with the diseases of the skin which they simulate.

Comment

Inasmuch as drug eruptions possess such unusual qualities, diagnosis often must be made by means of exclusion. Dermatologists have a convenient rule of thumb which holds that an eruption, which appears unexpectedly, and in an odd design which does not fit the pattern of the familiar clinical entities, is either a self-induced factitious affair or a reaction of the patient's sensitivity to medication.

The physician may be too timid or too indirect in questioning the patient to permit him to arrive at the correct diagnosis. When the eruption appears on the skin and drugs are suspected to be causative factors, it is not sufficient to abide by the patient's denial of usage of drugs. Many persons consider the term "drugs" to apply only to habit-forming narcotic agents. Moreover, many sensitizing drugs masquerade as harmless proprietary preparations under the influence of forceful publicity. Consider, for example, arsenic and iodides in tonics, bromides in "nerve medicines" and in remedies for headache and colds, phenolphthalein in cathartic agents, bile salts, "liver pills" and medicated gum. Unless these sources of supply of offending materials are carefully ruled out by direct inquiry of the patient, in language he can understand, the history will avail nothing. In some instances, it would be well to disregard a seemingly irrelevant history when the diagnosis seems objectively to be self-evident, and occasionally, to obtain definite proof, it may be necessary to provoke another attack by giving the patient small amounts of the suspected materials. This should not be done in a casual manner to satisfy intellectual curiosity, for embarrassing reactions and perhaps dangerous consequences may result from such a procedure if it is employed without caution.

Appreciation of the significance of drug eruptions and other reactions to drugs is important to the physician who uses arsphenamine in the treatment of syphilis. Exfoliative dermatitis would be a rare complication of therapy for syphilis if the earliest evidences of the patient's intolerance were understood and the warnings heeded. In such cases of sensitiveness, as well as in others in which drug eruptions have been noted, some conspicuous notification should be placed in the clinical records and indelibly impressed on the mind of the patient. Too frequently such a patient feels, and perhaps rightly, that proper precaution had not been taken in the selection of drugs or in the matter of dosage for him, because he has no understanding of idiosyncrasy. The wise physician will remember always that certain individuals possess the capacity to react to medications in a peculiar way.

FRACTURES OF THE DISTAL HALF OF THE TIBIA AND FIBULA*

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THERE is no doubt that fractures of the lower half of the tibia have always and will always present a special therapeutic problem. This is especially true if these fractures are spiral or comminuted in nature.

A system for the treatment of fractures of the lower half of the tibia and fibula is to be presented: (1) because it has given uniformly good results; and (2) because it is simple, and it is easy to carry out.

Transverse fractures need little discussion except to point out that the fragments should be restored to complete or nearly complete anatomical position. A simple technicality frequently overlooked in the process of reducing the fracture is failure to compare the injured extremity with the normal one. Special attention should be given to the bowing of the tibia, which normally

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Fig. 1.



Fig. 2a.

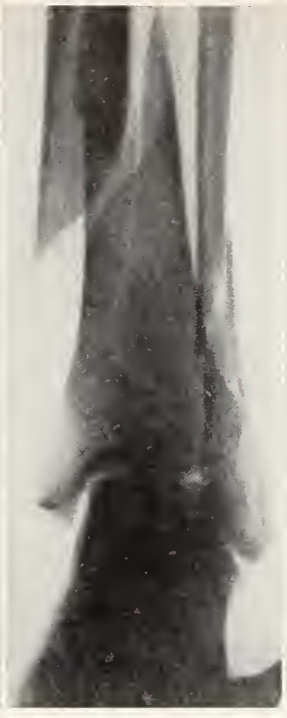


Fig. 2b.



Fig. 3a.



Fig. 3b.

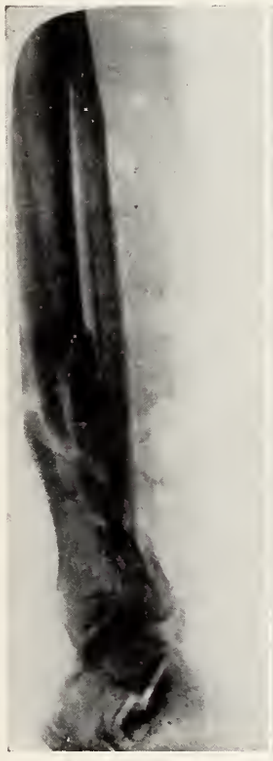


Fig. 4a.



Fig. 4b.



Fig. 5.



Fig. 6.



Fig. 7a.

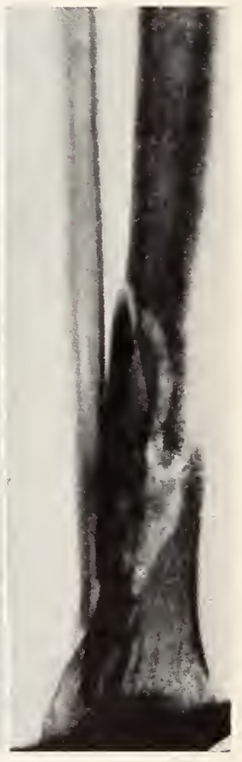


Fig. 7b.

may or may not be present. After reduction the extremity should be immobilized in a plaster-of-Paris cast. This cast should extend from the toes to the groin. The knee should be held in a position of from thirty to forty degrees flexion. This will prevent rotation of the fragments between the knee and the ankle. The foot is placed at right angles to the leg and in slight inversion. A mistake commonly made is failure to flex the knee sufficiently and failure to extend the cast to the groin. Many times a cast is seen which extends only six or eight inches above the knee. Immobilization of this type does not prevent rotation at the fracture site and frequently results in non-union.

Spiral fractures present quite a different problem in that reduction cannot be maintained in quite such an easy manner as in the case of transverse fractures. Therefore some other form of immobilization has to be used in order to maintain reduction. For these fractures the following proceedure has been carried out. First a

Steinman pin is inserted through the os calcis and the necessary dressing applied. With the aid of two or more assistants or a fracture table, the leg is placed in correct alignment and the knee is flexed to about sixty degrees. A plaster-of-Paris cast is then applied, holding the leg in this position. The foot is not included in the cast other than extension of a plaster splint over the dorsum of the foot. This extension of plaster goes beyond the toes to prevent the bed clothes from bearing down on the toes and it is also used later to help prevent a foot drop. An ordinary gauze bandage is used to support the foot. A stirrup (Fig. 1) containing a windlass is then incorporated in the cast. This stirrup is placed in the position of the lateral alignment of the tibia. Two strips of flexible material are then fastened to the Steinman pin. The anterior-posterior alignment is then completed and in this position the strips for traction are placed in the windlass and traction is made. Apposition and alignment are spontaneous. The leg muscles are well relaxed because of flexion of the knee. The thigh serves to give counter traction. Sufficient traction is made to obtain correct length. This is maintained until there is evidence of callus formation. The Steinman pin and the traction are then removed and a new cast is applied extending from the groin to the toes. The knee is held at about thirty degrees of flexion. When sufficient callus has formed to assure union, a short leg cast is applied and changed when necessary for the remainder of the period of immobilization. During the last few weeks of immobilization a walking iron incorporated in the cast may be used to good advantage.

In one case, as illustrated, the patient sustained a spiral fracture of the tibia and fibula as is shown in Figure 2. There is considerable overriding of the fragments as well as a marked amount of separation laterally. Figure 3 shows the result five months after injury. This patient was able to bear full weight without the aid of crutches six months after the accident.

This method of immobilization has worked equally well in cases of severely comminuted fractures of the lower half of the leg. The accompanying illustrations represent a case of a severly comminuted fracture of the tibia and fibula, with extension of the fracture into the ankle joint. Figure 4 shows the original fracture. Figure 5 illustrates a lateral view after reduction and Figure 6 shows the anterior-posterior view after reduction. The last illustration (Fig. 7) shows the end-result. This radiograph was taken eight months after the accident. There was no permanent disability.

Conclusions

1. The abnormal leg should always be compared with the normal.
2. Immobilization for fractures of the tibia should be obtained by a plaster-of-Paris cast applied from foot to groin.
3. The optimal positions in which to immobilize the knee and ankle in case of fractures of the tibia and fibula is discussed.
4. A simple, expedient, and relatively mobile method for the treatment of the difficult fractures of the lower half of the tibia and fibula is described.

TUBERCULOSIS MORTALITY AMONG WOMEN

As long as reliable mortality statistics for tuberculosis have been known, young women have always been more prone to die of tuberculosis than have their young brothers or older sisters. While the general death rate from tuberculosis has steadily fallen, the death rate among young women has also decreased, but at a slower rate. The fact remains that tuberculosis is prevalent enough, particularly among young women to warrant, in the opinion of many authorities, a tuberculin test on all pregnant women. Treatment of tuberculosis has advanced so rapidly in recent years, that with early recognition of the condition in pregnancy, it is possible in many cases to bring the baby through safely with no danger to the mother.—National Council for Mothers and Babies.

DIAGNOSIS AND TREATMENT OF CONDITIONS ASSOCIATED WITH VARICOSE VEINS*

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IN presenting this subject I am particularly interested in laying special emphasis on conditions encountered with varicose veins at the time of examination and in making suggestions regarding their treatment rather than the treatment of the varicose veins and complications resulting therefrom. During the last ten years much has been written about the diagnosis and treatment of varicose veins. Whether injection alone, single ligation at the juncture of the saphenofemoral veins, and multiple incisions to care for the incompetent communications of the deep system or combined surgical and injection treatment is the procedure of choice remains for the future to decide. Personal experience of many engaged in the work eventually will eliminate the procedures which results have proved inadequate.

Patients presenting themselves for examination of the extremities often have changes of the skin which are either directly attributable to incompetency of the veins or secondarily present as the result of local pathologic conditions. The contributing factors to the latter come from intercurrent complications arising either as a result of the varicosities or from extrinsic factors such as excessive weight, lymphatic occlusion, thrombophlebitis in varying degrees, traumatism and local infections. Among the more frequent conditions which I would like to discuss are changes in the skin varying from small discrete patches of eczema to diffuse involvement of the leg and ankle with occasional extension along a varicose vein onto the thigh. Patients afflicted with localized dermatitis usually give a history of varicose veins of many years' duration with local changes taking place at a subsequent date. Occasionally a patient will be seen who does not have any perceptible edema and only a small incompetent varix leading into the region, but who complains of itching. If the itching is of any duration, a thickened pigmented skin results and in turn a typical neurodermite develops.

Stasis Dermatitis

In the early stages of stasis dermatitis generalized edema of the skin with scaling is observed on the lower third of the extremity and the ankle. This gradually ascends as involvement becomes more marked. Essential characteristics are edema, crusting, weeping and marked itching.

Obliteration of the existing varices in the less extensive cases usually relieves the local itching. Application of 3 per cent ichthyol in zinc oxide ointment with a sponge pad or elastoplast bandage at intervals of five to ten days usually suffices. When a diffuse eczematous condition exists, the patient should be hospitalized, the leg elevated at least 30 degrees and cold applications of 0.5 per cent solution of aluminum subacetate should be used. This procedure not only relieves the excessive irritation of the skin but the edema of the leg. Sclerosing treatment of the incompetent vein is then begun and supportive bandages should be worn during and following the course of treatment for at least several weeks or months depending on the individual circumstance.

The presence of eczema and changes in the skin often obscure the basic cause. Incompetent veins are not always in evidence on the extremity or in the thigh. In many instances the great saphenous veins cannot be seen in the thigh but by manual palpation incompetence may be discerned which is indicative of a reversed flow of blood column and stasis with dermatitis ensues.

Brawny Infiltration

When local superficial lymphangitis of varying degrees has occurred, the inflammatory process results in destruction of the superficial lymphatics, and subcutaneous atrophy with discoloration and fibrosis occurs.

If extensive lymphangitis or cellulitis has appeared, annular constriction with lymphatic edema may be found below the involved region. Regions of brawny infiltration which are associated with impairment of nutrition and lowered resistance are fertile fields for ulceration and

*From the Section on Postoperative Care, The Mayo Clinic, Rochester, Minnesota. Read before the Meeting of the Upper Mississippi Medical Society, Cass Lake, Minnesota, August 10, 1940.

infection. Protective measures should be employed to prevent traumatism and if edema is more or less extensive, pressure pads of gauze or rubber sponge should be snugly bound to the leg by a good fabric bandage to facilitate circulation to the part.

Ulcers

Ulcers of the extremities occur from various causes and are often confused with varicose ulcers in the presence of varicose veins. Ulcers of fungus origin, such as blastomycosis, may be mistaken for ulcerous lesions of medicinal origin such as those caused by bromides or iodides. The treatment consists of administration of iodides, roentgen therapy and local treatment with iodine, electrocoagulation, carbon dioxide and deep freezing peroxide sprays.

Ulcers arising from local infection, such as insect bites or local trauma, ordinarily respond to local treatment and resolve in a relatively short time. Ulcers arising from medicinal basis respond by elimination of the drug. When they are infected secondarily, they may exist for a long period and may be mistaken for true varicose ulcers.

In cases of malignant ulcer in the presence of varicose veins with or without edema, there is usually a history of a small ulcer at the beginning and of gradual extension over a period of a few months to several years. The border of the ulcer appears blanched in contradistinction to varicose ulcers in which the edges are irregular and thick, and are usually discolored. In such cases biopsy should be performed and if the ulcer is malignant, surgical or radiotherapy or both should be instituted.

Ulcers Resulting from Arteriovenous Fistula.—"Hot ulcers," a term used to distinguish the arteriovenous ulcer from the ordinary varicose ulcer, are characterized by marked increase of local heat in the presence of edema and beginning atrophy. The arterial supply to the part is short-circuited and if many fistulous arteriovenous communications exist, ulceration occurs at the dependent part. Such ulcers are painful regardless of the type of treatment employed.

Elevation of the extremity does not relieve the condition as it does with true varicose ulcers and dependent positions intensify the pain. My experience has been that a bandage of heavy material and a level position seem to afford the best relief.

Syphilitic Ulcers.—Blood tests for syphilis reveal the origin of these ulcers. In addition the syphilitic ulcer has certain changes in the border that are suggestive of the etiologic factor although they are not clearly diagnostic objectively. The border of the ulcer is arciform and markedly indurated. Usually only a single ulcer is present. Specific treatment is consequently indicated.

Thrombophlebitis

Much has been written in textbooks and original papers regarding the hazards of treatment of varicose veins in the presence of thrombophlebitis. In a series of 491 cases in which treatment for varicose veins was given, 12.5 per cent of the patients attributed the cause to phlebitis. My first experience in treating varicose veins in the presence of acute thrombophlebitis occurred in 1931. The patient had rather mild, acute phlebitis of the left great saphenous vein after subtotal abdominal hysterectomy. Examination revealed two discrete regions of phlebitis along the course of the vein on the nineteenth or twentieth day after operation. The patient was not experiencing any systemic symptoms. I injected a minimal dose of sclerosing fluid into the vein in the middle and upper thirds above the sites of involvement. Undue symptoms were not noticed in the course of treatment. Since that time at the clinic we have disregarded phlebitis as a serious contraindication to the treatment of varicose veins with two exceptions: (1) when a systemic reaction such as fever, marked local redness and swelling are present, we wait until the activity has subsided and resolution is fairly well advanced; and (2) when swelling of the extremity and enlarged compensatory veins are noted, the deep circulation is always tested for adequate return of the venous flow. If no pain occurs after the patient has worn an Esmarch rubber bandage snugly applied from the toes to the knee for twenty minutes or so, the occlusion which is manifested by the dilatation of the collateral veins, is not sufficient to render treatment of the varices inadvisable.

Migratory phlebitis[2] may be differentiated from the usual thrombophlebitis for it varies both in its incipiency and recurrent tendencies. The

patients will present a small, tender, superficial patch which runs parallel to the vein with some perivascular lymphatic involvement. As the name suggests, new lesions appear frequently and the old ones may recur and subside. If it is extensive, slight rise in temperature may occur. In this condition the wall of the vein seems to be affected rather than the lumen and on palpation the vein seems to be of a cord-like nature. The lesions appear in segments of the vein and because of this tendency an infectious origin is suggested. Superficial veins usually are involved. The recurrence is of a migratory nature and a continuous regimen of treatment for from a few weeks to months may be necessary. This regimen consists of hospitalization, elevation of the extremity and application similar to those used in the treatment of ordinary thrombophlebitis.

Miscellaneous Conditions

Arteriovenous fistula in the presence of varicose veins is not always easy to diagnose, if there are no local changes in the skeletal structure such as enlargement of the bones or lengthening of the extremity. Bruit and thrill which are given in textbooks as positive signs of arteriovenous fistula, are not detectable in the majority of cases of congenital arteriovenous fistula. If varices fail to sclerose after successive doses of a number of sclerosing agents, arteriovenous fistula should be suspected. Study of the oxygen in the blood will clarify the diagnosis. If the oxygen content of the venous blood in the varix is more than 65 or 70 per cent, arteriovenous fistula is probably present.

Muscle sheath hernias appear as single or multiple protrusions on the lateral and posterior surfaces of the lower extremities. They are easily distinguished from varicose veins by having the patient stand on the toes for extension and then on the heels for flexion. In each instance the protrusion disappears if a muscle sheath hernia is present. If the protrusion still persists, varicose veins are probably a factor.

Baker's cysts of the popliteal space occasionally are found in the course of examination of varicosities. The fact that the lateral saphenous veins and the plaque of dilated veins from the great saphenous veins may be in the immediate region, may confuse the examiner and the cyst may be considered a part of the varicose involvement. Ruling out the presence of a cyst in the popliteal space will prevent complications. Such cysts are filled with synovial fluid and for that reason an accidental injection into the cyst might cause serious complications. To differentiate a cyst from varicose veins the patient should be placed in the prone position and the leg flexed to reduce the volume of fluid in the varices. If there is a marked prominence at this time, the chances are that a cyst is present. If this simple test is not conclusive a hypodermic needle should be inserted in the prominence and fluid withdrawn. If synovial fluid is obtained, the diagnosis is clinched.

Tuberculous lesions and erythema induratum are rarely encountered in varicose vein therapy. However, the possibility of such lesions should be kept in mind when indurated subcutaneous nodules are present which are tender to the touch. In such cases after several weeks or possibly months redness and occasional fluctuation with final necrotic surface may occur. These lesions are found for the most part on the posterior surface of the legs. Treatment consists of supportive bandaging, local topical applications of an antiseptic nature, tuberculin regimen and general systemic measures to increase body resistance.

Erythema nodosum is manifested by tender nodular lesions which may appear red and gradually fade to a purplish hue when receding. They usually are situated on the anterior surface of the legs. The trunk and arms are occasionally involved. Clinical examination usually reveals fever and the history of arthritis although in the persistent type of the disease, tuberculosis is a frequent cause. As for treatment, the administration of salicylates, local astringents, rest, and so forth are the usual procedure.

Pyoderma gangrenosum[1] is characterized by discrete pustules which enlarge and necrose. If there are many in a small region, they coalesce in a crusting ulcer. The edges may be undermined and the contour is usually oval. When such an ulcer is found there is likelihood of its being secondary to some internal systemic infection. It has been suggested that ulcerative colitis may be a factor. Hemolytic streptococcus and staphylococcus have been isolated from the ulcer. Treatment consists of endeavoring to find the invader and then to treat it. Various local treatments have been tried with some degree of suc-

cess; these consist of specific serum and topical dressings, heliotherapy, and so forth.

Summary

I have attempted to call attention to possible associated conditions in the presence of varicose veins and to discuss their treatment not in detail but sufficiently to put the physician on guard against committing undue errors in management. Whenever systemic involvement is associated with lesions of the extremities, treatment for varicose conditions should be deferred.

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METASTASIZING ARGENTAFFINE TUMOR OF THE CECUM IN A CASE OF MULTIPLE COLONIC MALIGNANCIES*

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ALTHOUGH there are a great many reports in the literature concerning cases of carcinoid tumors of the appendix, tumors of this type occurring elsewhere in the gastro-intestinal tract are relatively rare. Evidence of extension from the site of origin of these tumors is even less commonly encountered. Wyatt, in 1938, reported a case of "multicentric carcinoid" of the cecum in which the tumor had metastasized to the liver. Including the case of Wyatt, only nine cases of this type of tumor of the large bowel have been reported, of which only three have been found to have either local or distant metastasis. Of the cases of carcinoid tumors of the appendix, only five have been found to have extended beyond the organ itself, although many such tumors have been reported on in the literature. Only thirty-six cases of this type of tumor of the small intestine in which extension was found on examination have been reported. Because of the relative rarity of extension in this type of lesion, particularly when the lesion is situated in the large bowel, it was felt that the following case would be of interest.

Report of Case

The patient, a white woman fifty-five years old, was admitted to The Mayo Clinic on March 11, 1939, complaining of pain in the left lower quadrant of the abdomen of about three and a half years' duration. On two or three occasions she had passed bright blood per rectum. Associated constipation of considerable degree was present, so that it had been necessary for her to use enemas almost daily. Physical examination revealed essentially normal observations. Proctoscopic examination showed that a polypoid carcinoma was situated 10 cm. above the dentate margin; the lesion involved the left and posterior walls of the rectum. This lesion extended for 16 cm. proximal to this point. Biopsy revealed the tumor to be an adenocarcinoma, grade 1. Because of the presence of this lesion in the rectum, roentgenologic examination of the colon was not made before operation, since it was desired to prevent possible obstruction which might have resulted from the retention of barium proximal to the rectal growth had such an examination been attempted. The plan was to perform a one-stage combined abdominoperineal resection.

On March 13, 1939, a primary left rectus incision was made. Examination of the rectosigmoid revealed a neoplasm as described at the time of proctoscopic examination; it was attached to the lower portion of the uterus as well as to both fallopian tubes and ovaries. The liver and gall bladder were normal to palpation. Examination of the cecum revealed a small mass, about the size of a golf ball, situated in this region close to the ileocecal valve, and there were palpable glands in the right part of the mesocolon. It was felt that this lesion unquestionably was another carcinoma. Accordingly, one-stage resection of the right portion of the colon was performed and an end-to-side ileotransverse colonic stoma was made. Single barrel colostomy, after the method of Lahey, also was performed, so that in the future the second part of two-stage abdominoperineal resection could be accomplished.

The patient's convalescence was excellent following this procedure, and on April 13, she underwent the second part of the combined abdominoperineal resection. The inflammatory reaction around the rectal lesion was much less this time than it had been previously, a fact

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which enabled the surgeon to strip the uterus and right fallopian tube free without any difficulty. It was necessary, however, also to remove the left fallopian tube.

Progress of the patient after performance of this procedure was satisfactory and she left our care on May 11 in excellent condition, having gained several pounds since undergoing her last operative procedure. She was seen again February 20, 1940, at which time her general condition was excellent and there was no evidence of any malignancy.

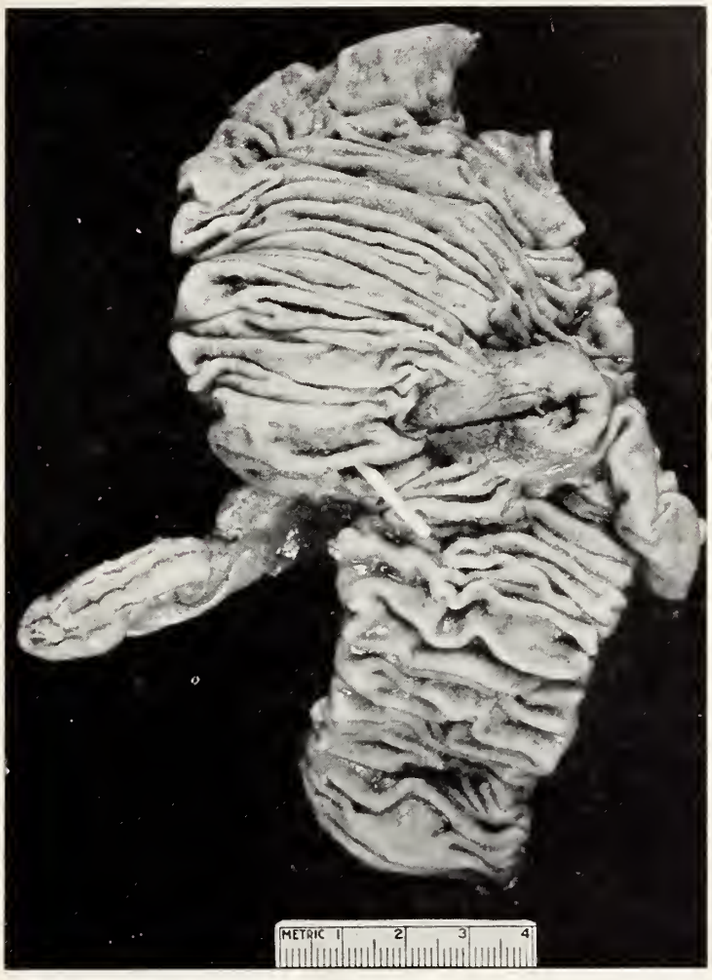


Fig. 1. Grade 2 adenocarcinoma of the cecum of the so-called carcinoid type.

On gross pathologic examination of the cecum, the tumor (fig. 1) was found to measure approximately 4 cm. in diameter; it presented a characteristic orange-colored appearance on cut section. The neoplasm was situated approximately a half inch (1.27 cm.) from the base of the appendix and this rudiment was not involved. On histopathologic examination (fig. 2) it was found to be an adenocarcinoma, grade 2, of the "carcinoid" type with involvement of the regional lymph nodes. The cells of this tumor were found to contain granules which reduced silver. Pathologic examination of the tissue removed from the rectum showed the tissue to be polypoid carcinoma, grade 1, without glandular involvement.

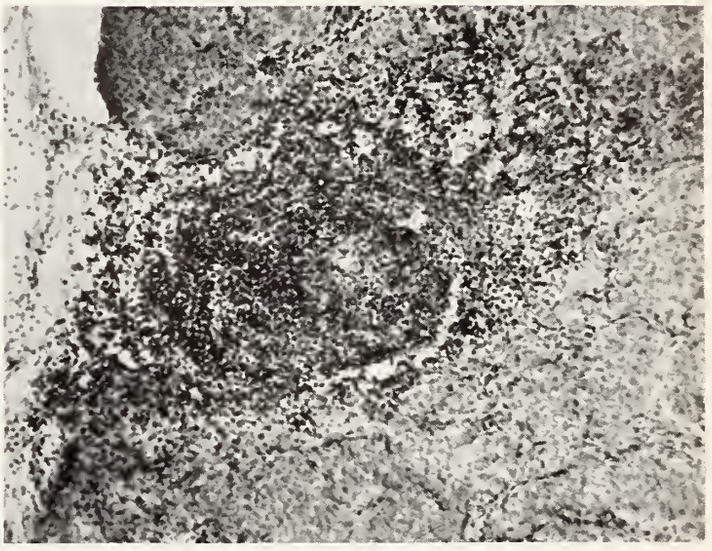


Fig. 2. Section of same tumor as that shown in Figure 1. The cells of this tumor contained granules which reduced silver (hematoxylin and eosin; x135).

Summary and Conclusions

It is generally conceded at present that the so-called carcinoid tumors arise from the Kultschitzky cells which are found in the base of the crypts of Lieberkühn. The ability of the cells of this tumor to reduce silver provides the surgeon with a postive means of diagnosis, although if ordinary hematoxylin and eosin preparations are used, the arrangements of the cells in groups will be characteristic enough. On gross examination the surgeon may gain an impression of the nature of the tumor by the yellow color which, in most instances, is present. Although there are those who still deny the malignancy of carcinoid tumors, it becomes more obvious as more cases are reported that actually they are true carcinomas.

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In a ten-year tuberculin-testing program in rural and town schools in four counties in Minnesota the percentage of reactors has fallen from 14.1 to 6.75 per cent. The decrease is attributed to a careful follow-up of all positive reactors, with an intensive search for the source of the infection. Contact with open cases of tuberculosis was broken by hospitalization of the case or placing the children in a home free from tuberculosis. All teachers and school personnel were included in the plan.

CASE REPORT

CONTACT DERMATITIS DUE TO NAIL POLISH

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NAIL polish was introduced some twenty years ago. However, not until 1937[1] was there any report in the literature of contact dermatitis due to nail polish. The absence of reports and its sudden appearance in the literature indicate that nail polish as a cause of dermatitis has been overlooked. The reason, however, is self-evident because of the peculiar distribution of the eruption. Even though the nail polish is applied on the fingernails, the eruption usually appears on the eyelids, face, neck or arms.

Case History

Miss H. O., aged thirty-two, was referred on January 8, 1941, because of an eruption of one year's duration. The dermatitis involved both alæ nasæ, both eyelids, and the right side of the face extending to the lobe of the right ear. The eruption was somewhat patchy in distribution, erythematous and scaly, with very mild evidence of vesiculation.

The patient stated that the eruption first appeared in December, 1939. At that time she complained of intense itching, puffiness of the eyelids, and a burning sensation on the right side of the face. Aside from an acute episode of hives, which she ascribed to the ingestion of tomatoes ten years previously, her familial and personal allergic histories were negative. The patient's occupation was that of a buyer in a department store where she handled fabrics, mostly rayon and printed cotton. The character and location of the eruption did not suggest an atopic etiology. A contact dermatitis was suspected, especially one due to cosmetics.

Patch tests of the following substances were applied: lipstick, face powder, perfume, cologne, mascara, rouge, rayon, soap, printed cotton, and nail polish. The patient was instructed to return in forty-eight hours, but was to remove any patch test that itched considerably. After thirty-six hours, the itching at the site of the nail polish patch test became so intense that she removed it. When the patient reappeared in the office that same afternoon, an elevated papulovesicular plaque was noted at the site of the nail polish patch test. All the other patch tests were negative. The patient was then instructed to remove her nail polish. Under mild local therapy, the dermatitis disappeared within three to four days. The patient was then tested with the clear lacquer base and a different shade of the same brand of polish. Both of these patch tests were markedly positive, indicating that it was the lacquer base and not the dye which was the cause of the dermatitis.

Discussion

The above case illustrates many points. First of all, any skin eruption, atypical in character, location, and distribution, should be suspected of being due to contact to an offending substance. Second, contact dermatitis can be exceedingly polymorphous[2] in character, varying from an erythematous to a vesicular or pustular eruption. Third, in all cases where cosmetics are suspected as a possible cause of a dermatitis, nail polish should be included in the testing.

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TRANSMISSION OF BACTERIA IN VENTILATING SYSTEMS

In present-day air conditioning systems 90 per cent of the cooled air is often recirculated. The redistribution of air from an infected space to noninfected areas might conceivably become a factor in the spread of disease. In a recent study† of the rôle of ventilating systems in the transmission of microörganisms, bacteria (B. subtilis spores), which can be readily distinguished from other organisms usually found in air, were introduced in two different ventilating systems and the distribution of the spores was studied. The first ventilating system, which was provided with a paper-tissue filter, was located in a small auditorium. In one instance the spores were introduced beyond the filter and were thus not filtered, and in another experiment the spores were introduced in front of the filter and the air carrying them was filtered before being circulated. Fifteen minutes after the spores were introduced beyond the filter, analyses indicated the presence of 21.9 organisms to 10 cubic feet of the air in the auditorium. One hour after the spraying of the spores no organisms could be found in the air. Fifteen minutes after spraying spores in front of the filters only 3.7 organisms were present in 10 cubic feet of the air and after an hour these too had disappeared. In another series of experiments spores were introduced at different points in the ventilating system of a large building. Analyses of the air in two rooms of the building showed a maximum concentration of organisms during the spraying, which in these experiments lasted for a twenty-minute period or during a short period (one-half hour) thereafter. The number of organisms then decreased rapidly and within a relatively short time the count returned to a normal level. This rapid decrease is attributable to the dilution factor, and to the action of the filter, as well as to the loss occasioned by surfaces such as the walls and floor. These experiments were made under the most favorable conditions for the transmission of bacteria in ventilating systems, the number of spores being far in excess of that which might be possibly expected to occur normally and the spraying being done at advantageous points, and they demonstrate that bacteria may be spread in this way, although the menace seems slight. The problem merits further study from the point of view of public health.

†Dalla Valle, J. M., and Hollaender, Alexander: A Study of the Rôle of Ventilating Systems in the Transmission of Bacteria. Pub. Health Rep. 55:1268, (July 12) 1940.

HISTORY OF MEDICINE IN BROWN COUNTY

Compiled by George B. Weiser, M.D.

THE medical profession was well represented in the early settlement of Brown County, which was created by an act of the Legislative Assembly of the territory in February, 1855. According to well-established tradition, Brown County was named in honor of that picturesque frontier character, Joseph Renshaw Brown, early legislator, Indian agent, soldier, newspaper publisher, inventor, founder of cities and all round leader of men. Even for these days, with their broad stretches of unoccupied land, it was a county of tremendous proportions, covering approximately 42,000 square miles of territory and embracing all that part of what is now Southwestern Minnesota between the Iowa boundary on the south and the Minnesota River on the east and north, and in addition thereto all that part of what is now South Dakota lying east of the Missouri River and north of Sioux City.

In the time of its creation the only white settlers within its vast borders, excepting, of course, those attached to the government agencies and the Indian Missions on the new Sioux Reservation, were the thirty or more men, Germans, who had come out from Illinois the previous fall for the purpose of establishing a townsite for the Chicago Land Society. Partly because of the lateness of the season, they had located for the winter in a sequestered spot along the Minnesota River in what is now the township of Milford. These were the settlers who, with the arrival of some twenty additional members of the society about the middle of the following May, founded the town of New Ulm just a little more than three months after the county's creation.

In February of the following year the newly established village was officially designated as the county seat. Unlike the many other towns which had come into existence in the southern part of the territory immediately following the promulgation of the treaties of Travers des Sioux and Mendota, New Ulm can hardly be said to have been a hit-and-miss settlement, which just happened and then grew up. Instead, it was a carefully planned colonization effort in which two distinct organizations played an important part—one, the Chicago Land Society, organized in 1855; the other, the Turner Colonization Society, which came into being a year or two later.

Both of these organizations were made up almost entirely of Germans, many of them being emigrants who had been compelled to flee the old country as a result of the failure of the liberal revolution in Europe in 1848. They were all well schooled and among them was a very large percentage of highly trained artisans.

They came here at an inopportune time, during a period of great business depression. The urge which prompted the organization of their societies was practically the same in each instance—dissatisfaction with economic conditions, disgust with the welcome accorded them by the older settlers and an almost universal desire among them to found a community somewhere on a new

frontier where they could work out their social and economic problems in their own way, free from the bigotry and class hatred which characterized their first introduction to American equality and freedom. The Know-nothings, a secret political party in the United States in 1855, were opposed to foreign immigrants. Their principal tenets were opposition to the naturalization of foreigners and to their eligibility to hold office. They also advocated uncompromising antagonism to Roman Catholicism. Many of these early settlers were of that Christian faith. This society flourished in Chicago and in the East, and made it very unpleasant for foreigners.

The first step, as we have seen, was taken by the Chicago group in the founding of New Ulm in 1855. The next year representatives of the Cincinnati Society appeared on the scene and by reason of their stronger financial setup, were easily able to take over the original townsite by purchase and bring about a harmonious merger of the two organizations. Nothing like a deal of this kind, as far as we know, has ever occurred in Minnesota history. From this time on, for several years at least, the sun seemed to shine on the pioneer adventure. Kindred spirits in all parts of the old frontier were attracted by the courage and initiative of these resolute pioneers, and the growth of the new community was unusual.

In 1857, for example, when the town was only two years old, the special census shows a population of 478. In 1859 the first newspaper was started. There were fifty-four births in New Ulm that year. In 1860, when the regular census was taken the population was 635, the total population of Brown County being 2,300. During the Indian Massacre nearly 200 buildings were burned, either by the Indians, or by the defenders, to prevent them from falling into the hands of the attacking savages. All that remained standing were the twenty-five or thirty buildings within the barricades. Within these had to be crowded some 1,500 inhabitants, refugees and neighborhood defenders.

Outside physicians and surgeons who came to the aid of New Ulm during the second attack were Dr. Asa W. Daniels of Saint Peter, who had been one of the earliest surgeons at Fort Ridgley and later the government surgeon and physician for the Lower Reserve; Dr. Wm. R. McMahon of Mankato; Dr. Otis Ayer of Le Sueur, and Dr. W. W. Mayo of Le Sueur, father of the famous Mayo Brothers of Rochester.

In the early nineteen hundreds Dr. Valin, pathologist at St. Peter Hospital, started a class for practical instruction in bacteriology and urinalysis at New Ulm. This class consisted of Dr. O. C. Strickler, Dr. L. A. Fritsche and Dr. George B. Weiser. Dr. Valin came to New Ulm every week for a period of several months. He was an able instructor but somewhat irritable and eccentric at times.

During the early years the following practiced midwifery in New Ulm and the surrounding country: Frau Ottomeyer and Mrs. Schmidt in New Ulm; Mrs. Gluth in Milford township, and Mrs. Kloecke in Sigel township.

Hospitals of Brown County

It was largely as a result of the diphtheria epidemics in the eighties that interest was aroused among the residents of New Ulm in building the **Saint Alexander Hospital.** Rev. Alexander Berghold, who was instrumental in starting definite action, solicited the citizens for funds and met with generous response.

A house and lot were contributed by Mrs. Mary Schulz and the hospital was opened in 1883, with a capacity for twenty patients. Whatever the equip-

ment was, we know at least that it provided "Warmbäder, Kaltbäder, Turkishbäder" and that the "Preis von 25c für ein gewöhnliches Warmbad ist ein so niedriger dass sich auch der Aermster diese Wohlthat zu gniessen im Stand ist." The first house physician was Dr. O. C. Strickler. Other staff members were Drs. L. A. Fritsche, Jacob L. Schoch, C. B. Hirsch and George B. Weiser.

The Saint Alexander Mutual Aid Society was organized at about the same time the hospital was opened. The membership fee was 50 cents a month for men and 25 cents a month for women, in return for which the members received free hospital service in case of illness.

The Saint Alexander Hospital in 1884 was renamed the **Loretto Hospital.** It was conducted by the Poor Handmaids of Jesus Christ, and was started with a staff of six Sisters from the Provincial Mother House, Fort Wayne, Indiana. Venerable Mother Prudentia was the first Mother Superior.

The rapid growth of the hospital services necessitated a new addition in 1886, a third addition in 1900, and a fourth in 1911.

On November 27, 1912, the corner stone of the present Loretto Hospital was laid by Rev. Father Schlinkert, and on June 15, 1913, the building was dedicated by Archbishop John Ireland.

The present building is of modern, fireproof construction and is equipped with all modern appurtenances necessary for a standard hospital. It has a bed capacity for forty-five patients, with eight bassinets. A home for the aged with a bed capacity of fifty-six is maintained in a separate building. All practicing physicians in New Ulm are members of the hospital staff.

Union Hospital, opened to the public in 1914, was established through the agency of the Protestant people in the community and was organized as a stock company with directors and officers.

The hospital is housed in a three-story, fireproof building and has a capacity of sixty-two beds and nine bassinets. All physicians practicing in New Ulm are members of the staff. Union Hospital is thoroughly equipped and standardized to conform with the regulations of the National Hospital Association.

Saint John's Hospital at Springfield, Brown County, was founded in 1901 through funds obtained by subscription. It has a capacity of nineteen beds and five bassinets.

Sickness and Epidemics in Brown County—1860-1900

The *Saint Peter Tribune* of February 22, 1865, stated that there were fifteen cases of smallpox in and around New Ulm. In 1867 smallpox broke out in New Ulm in a violent form. In 1869 the *New Ulm Post* reported more illness among the children than at any time since 1862. There were seven or eight deaths resulting from summer complaint.

A newspaper reference in 1876 notes a fatal malady among the children which had caused a number of deaths. Dr. Berry believed it to be an aggravated form of sore throat caused by damp weather and impure effluvia from the gutters and cesspools. The following year there were several newspaper references to the fact that Dr. Berry was well supplied with fresh vaccine virus and would gratuitously vaccinate all those who applied. This may or may not have been an indication of smallpox in the vicinity. At any rate it shows a greater consciousness of preventive measures.

In 1879 there was an outbreak of diphtheria in Iberia, Stark and Cottonwood townships. Early in 1880 the *New Ulm Post* stated that three of the most afflicted families in Sleepy Eye had lost a total of fourteen children within four-

teen days. In Mulligan township nineteen children had died within three weeks. The following June several physicians from Brown County and Blue Earth County met to discuss the situation. Occasional deaths still occurred throughout Brown County during the fall and by January of the following year another epidemic was well started. This continued through the year 1882 and in the winter of 1883 cases occurred in all sections of the county. New Ulm seems to have had few cases in proportion to its population. This may have been due to the fact that the rural communities did not have the benefit of local Boards of Health and that quarantine was less strict.

In 1885, 1886 and 1887 there were scattered cases. Diphtheria seemed to be the disease which affected the county to any extent and it was largely due to concern over the fatalities resulting from this disease that the first hospital was established in New Ulm.

Scarlet fever and diphtheria prevailed during the nineties and throughout the next few years various counties were affected. In the winter of 1893 there were a number of cases in Stark and Sigel townships. In Sleepy Eye alone twenty-three cases of diphtheria were reported. Dr. Fritsche, health officer of New Ulm, reported that scarlet fever had been prevalent to a small extent for many years in New Ulm but did not become epidemic until September 18, 1892. Unfortunately the first cases were not reported to the authorities because of fear of quarantine. On December 2 sixty-two families in the city had been affected and the City Council enforced a rigid quarantine regulation. This regulation met with opposition from the Lutherans of the city since it interfered with regular gatherings of the congregation. Before the regulation went into effect twenty-one families had been attacked. Three weeks after enforcement of the regulation there were only three cases. By April 2 there had been 210 cases and twenty-six deaths. The majority of cases were among children under ten years of age.

Activities of the health officer also included the examining and killing of glandular horses in Sleepy Eye. The health officer in Sleepy Eye at that time was Dr. J. W. B. Wellcome. Those who served New Ulm from time to time were Drs. Weschcke, Fritsche and Strickler.

Brown County Medical Society

The Brown County Medical Society was organized October 8, 1895. All the physicians of the county were present at the organization of the Society except Doctors Rothenburg and Adams.

The following were the first officers:

President—Dr. J. W. B. Wellcome, Sr.
Vice President—Dr. C. B. Hirsch.
Secretary—Dr. O. C. Strickler.
Treasurer—Dr. T. Sullivan.
Executive Committee—Dr. L. A. Fritsche, Dr. J. W. B. Welcome, Jr., and Dr. T. Sullivan.

In January, 1896, there was another meeting at which Dr. Pucklitsch read a paper on the cause and treatment of pneumonia. The newspaper account said that the Society would hold its regular monthly meeting, so we may conclude that the organization was pretty well established. This meeting was attended by physicians from Redwood County and other surrounding localities. Dr. George B. Weiser read a paper on "Infectious Diseases."

At a later meeting of the Society Dr. Todd of Minneapolis and Dr. McDavitt of Saint Paul read papers. Dr. Weiser read a paper on "Administration of Anesthetics."

Redwood-Brown County Medical Society

During the World War the charter of the Brown County Medical Society was revoked by the arbitrary ruling of the State Medical Association. Charges of disloyalty were preferred, but there was never an investigation made to sustain the charges, nor could disloyalty have been substantiated among the members. After the war the State Association, without apology for the actions taken in revoking the Society's charter, requested the former members of the Brown County Medical Society to re-organize under the name of the Redwood-Brown County Medical Society.

On December 23, 1919, at the office of Dr. J. C. Rothenburg at Springfield, the members of the former society met to organize the new society. Dr. Rothenburg acted as temporary chairman and it was moved and carried that the temporary organization be made permanent. The following officers were then elected:

President—Dr. C. C. Walker, Lamberton.
Vice President—Dr. E. Jamieson, Walnut Grove.
Secretary-Treasurer—Dr. W. A. Meierding, Springfield.
Board of Censors—Dr. J. Adams (3 yrs.), Dr. M. Sundt (2 yrs.), Dr. Mary Strickler (1 yr.).

The Society at the present time (1940) is in a flourishing condition, having thirty-one members. Quarterly meetings are held with papers and discussions by outside physicians from the University of Minnesota, and the Mayo Clinic as well as by local physicians. Attendance of the full membership is usual.

Physicians and Surgeons Located at New Ulm

Dr. C. H. Blecker advertised in the New Ulm *Pioneer* as Deutscher Arzt from June 1, 1858, to February 24, 1859. The *Pioneer* also contained the cards of Jacob Fleck and wife in 1858. Dr. Fleck was a barber who did bloodletting, extracted teeth, et cetera.

Dr. J. B. Calkins came in 1852 and remained about two years. He held a claim of land at Leavenworth.

Dr. John Kaula, a Hungarian, a graduate of the University of Budapest (about 1840), came to the United States as a political exile. He was a follower of Louis Kossuth, the Republican leader of the Revolution in Hungary in 1848. Dr. Kaula came to the United States in 1849 and practiced in Chicago until the founding of the New Ulm settlement. He was a good botanist and prepared roots and herbs whenever needed in the form of concoctions. He used quinine, mercury and salts liberally. He underwent all the exposures incident to pioneer life. It is said that he walked five miles in the snow to attend a case in confinement. He retired in his later years but remained in New Ulm until his death which occurred in his eighty-fifth year in 1892.

Dr. Carl Weschcke advertised as Praktiker Arzt and Wund Arzt as early as June, 1860. He was born in Saxony in 1831. He was educated in that country, passed through the Military Surgery Department of the University of Berlin, then through the University of Griefswald, graduating in 1856. He then attended Halle University where he served in the army one year, according to law.

He came to New Ulm in the year 1860 and he and Dr. Kaula were the only resident physicians during the Indian Massacre in 1862. Dr. Weschcke was employed as Military Surgeon for soldiers. In 1868 he went to California,

where he remained several months. He became sick, however, and returned to New Ulm. Dr. Weschcke was the first pharmacist in Brown County and in 1866 established the first drug store in New Ulm, known as the Pioneer Drug Store, now the Epple Drug Store. Dr. Weschcke was civic minded. In 1870 he was elected to the New Ulm City Council and subsequently was appointed to the office of mayor in 1877. He served in that capacity for fifteen years. He died at New Ulm in the year 1906.

Dr. Winkelmann advertised as Arzt, Wund Arzt, and Geburtshilfer Zahn Arzt, from March, 1858, to April 14, 1859.

Dr. Truman R. Humphrey was a native of Vermont. He received his medical education in Boston and was one of the early white settlers in western Brown County. His first practice was in Stoughton, Massachusetts. Thereafter he practiced in Thornton, New Hampshire, until 1859 when he moved to Hokah, Minnesota, where he took a homestead. In 1864 he took a claim three miles southeast of Sleepy Eye in Albin township, and remained on the farm for forty years. He practiced medicine in that community over a period of twenty-five years. He was coroner for Brown County from 1887 to 1892. After retiring from the farm he moved to Sleepy Eye, where he died in 1911.

For many years Dr. Humphrey was one of the most influential residents of western Brown County. He and his wife took an active part in the development of the social and economic conditions in that part of the county.

Dr. August Westphal advertised as Zahn and Augen Arzt from February, 1860, to March, 1861. He opened the first school on December 17, 1857, and was its teacher. After the Indian War in 1862 Dr. Weschcke and Dr. Kaula had the field to themselves until about the year 1867.

Dr. Alfred Mueller was born in Berne, Switzerland, in 1835. There he obtained his literary and medical education, graduating in medicine in 1852. In December of that year he came to the United States, locating in New York City for a brief period. In 1856 he came to Minnesota, locating at Stillwater until 1861 when he was appointed Surgeon-in-Charge of Fort Ridgely where he remained until 1867. He was the only surgeon in charge during the battle with the Sioux.

After the military post was abandoned he moved to New Ulm where he followed the practice of his profession until 1889, retiring to his native Switzerland to pass his declining years. He died in 1899.

Dr. Mueller married Eliza Eichelberger who died in 1876. At the trying hours during the Indian outbreak at the fort she did not spare herself in nursing the sick and wounded men. Due to exposure and laborious efforts in ameliorating the sufferings of the sick, her health became undermined and this, it was believed, hastened her death. She was the Florence Nightingale of Fort Ridgely.

A monument has been erected by the state at Old Fort Ridgely to commemorate her labors in behalf of the afflicted during the siege of the Fort The monument has the following inscription:

> "Mrs. Eliza Mueller, wife of Dr. Alfred Mueller, born in Berne, Switzerland, April 21, 1831; died September 26, 1876. Thy Mission on Earth was unbounded Charity; Thy Reward is Eternal Peace."
>
> "Her valor and devotion to the care of the sick and wounded soldiers and refugees during and after the Sioux Indian Outbreak of 1862 will forever be cherished in the hearts of a grateful people."

Dr. Mueller was one of the outstanding physicians of this part of the country. While a student in Berne, Switzerland, he was an instructor in anatomy. When Dr. Fritsche visited him in Berne in 1889 Dr. Mueller took him to the Medical Museum to show him an anatomic specimen which he had prepared thirty-seven years before; it was still in good condition. Dr. Mueller was considered one of the best surgeons in this region. He served as chairman of the town board of New Ulm in the early days and was a member of the pension board. He was a member of the Blue Earth County and Minnesota Valley Medical Societies as well as the Minnesota State Medical Association.

F. Zur Netten, a German physician, practiced in New Ulm in the late fall of 1883.

Dr. G. A. Sellmer located in Lake Hanska and Linden township in 1873. He practiced there until 1890 when he decided to go back to Norway.

Dr. J. L. Wellner practiced in Brown County in the early eighties. He served as county physician for a time.

Dr. Marcel Zenopalsky advertised as Amerikaner-Deutscher Arzt and Wund Arzt from June 2, 1860, to June, 1861. His advertisement in a New Ulm paper stated he could prevent and cure scarlet fever for 25 cents. He later moved to Blue Earth County.

A **Dr. Wilson** located at New Ulm in 1870, remaining until November 3 of the following year. He died in 1872 and is buried in the town of Leavenworth, Brown County. He was addicted to drink and when imbibing entertained his company by singing such songs as "Coming Thru the Rye."

A **Dr. M. W. Scott** came from Morristown, Minnesota, in 1870, or thereabouts, and located in New Ulm. After a year he moved to the Dakotas. His fees were 25 cents in town; 50 cents in the country.

Dr. A. F. George, evidently a college graduate, started practicing in New Ulm in July, 1870, and remained for a brief period.

Drs. Weems and Menning opened offices in New Ulm in May, 1872. The partnership was dissolved the following September and Dr. Louis Menning continued the practice until March, 1873. He later located in Ohio.

Dr. J. W. B. Wellcome located in New Ulm in 1871 and remained until 1874; he returned for a few months in 1879. Dr. Wellcome was born in New Portland, Maine, in 1828. At the age of sixteen he entered Burnhame High School where he remained three years. He then studied medicine, received his diploma and, in 1856, went to Wisconsin where he practiced until 1858. The following year he located at Garden City, Minnesota. In 1883 he received a diploma from St. Louis College of Physicians and Surgeons. In 1862 he was appointed examining surgeon for the drafted men in the Civil War, with offices at Mankato. In 1863 he was first surgeon, substituting for Dr. W. W. Clark, who was ill. In 1872 he was appointed surgeon for pensions, holding the position for four years.

Dr. Wellcome assisted in forming the first medical society in the Minnesota Valley. He was at Garden City during the Sioux uprising in 1862. From Garden City he moved to New Ulm in 1871 and in 1874 located at Sleepy Eye where he continued the practice of medicine until the time of his death in 1906. He was an Active Free Mason, was civic minded and took an active interest in advancing the civic affairs of Sleepy Eye and adjacent community.

Dr. Wellcome, as was customary in those early days, acted as preceptor for several young men, namely—Dr. J. W. Andrews of Mankato, Dr. J. T. Burnside of Duluth, and his son, Jacob Burnside, Jr. Dr. Wellcome died of carcinoma of the neck.

Dr. B. Hofstetter located in New Ulm from October 20, 1871, until May, 1873.

Dr. Charles Berry, one of the leading practitioners of this community, arrived in New Ulm in March, 1873. Dr. Berry was born in Coleville, New York, in 1837. He studied medicine in Concord, New Hampshire, and in 1859 graduated at the University of Michigan; he also graduated from the University of Buffalo, New York, in 1870. Dr. Berry enlisted as an assistant surgeon in the 106th New York regiment and served until the Civil War closed. On account of impaired health he came to Minnesota in 1866, locating at Belle Plaine. In 1872 he commenced the practice of medicine at New Ulm, continuing until the time of his death, July 18, 1890.

Dr. William Wakefield, graduate of University of Michigan Medical College in 1882, located at New Ulm for several years, then moved to Lake Benton, Minnesota, where he continued practicing medicine for many years until his death.

Dr. Eli Kuhlmann located at New Ulm in the latter part of 1879 and remained there until October, 1881. He was a physician and chemist and ran a drug store. He gave special attention to chronic diseases. A year later he moved to Indiana, where he died.

Another physician who came to New Ulm in 1879 was **Dr. B. Carl,** whose real name apparently was **Carl von Neufert.** Dr. von Neufert was born in Bavaria in 1839. He attended the University of Wurzburg in 1865 and served as surgeon in the army in his native country. He practiced in Bavaria for ten years before coming to the United States. He practiced at New Ulm until November, 1884, when he moved to Colby, Wisconsin; later to Stevens Point, Wisconsin. His son, Carl von Neufert, F. A. C. S., became an eminent surgeon at Stevens Point, Wisconsin, where he began practicing in 1892. He has been made an honorary member of the State Medical Society of Wisconsin.

Dr. B. M. Randall, son of the well-known Fort Ridgely settler, Major B. H. Randall, located at New Ulm in December, 1884. He remained there until January, 1887, when he removed to Graceville, Minnesota, where he practiced many years. He was a graduate of Rush Medical College, Chicago, in 1883.

(To be continued in April issue.)

President's Letter

THE PATIENT-PHYSICIAN RELATIONSHIP

HISTORIANS tell us that history repeats itself, that discoveries of archeologists show as fine and as high a type of civilization in the dim past as we have now. Economists speak of the worries and the concerns of past ages, the modes of living under the then existing economic conditions, of dollar values, of periods of depression and times of plenty with waves of prosperity.

Today we find that the nature of people has not changed to any great extent; that the psychology of life has remained about the same; that thoughts which we might attribute to one century and people carry over into the next century; that the brotherhood of man in this so-called changing world still hinges around the Golden Rule.

The physician, since the time of Hippocrates, has believed in free enterprise in the practice of medicine. The physician-patient relationship is founded on faith and honesty, a sacred trust which has survived the vicissitudes of time. The men of our Association, more and more, are coming to believe in this relationship.

If we are to live in a democracy, true democratic principles in word and deed must prevail. There can be no half-way between state medicine and our present type of practice. The public has been and will be better served under our present method. We are banded together in a mutual help organization, not a trust or corporation for profit, with a firm and steadfast purpose of increasing the joy of living by aiding the people of our nation to better health.

We are coöperating with the government in national defense, giving of our time and knowledge without even ordinary compensation for our time. Many of our members are leaving their homes and practices at great sacrifice to enter military service. Can we be called selfish in our desire to protect a principle most dear to us?

We know that in private practice, faith plays a great part in cure when it overcomes fear. This faith causes the patient to follow his physician's bidding, and can only be found where the present type of practice prevails.

Civil governments and industrial compensation boards recognize this when they grant to an employe the right to choose his own physician and surgeon. When dictators and dictatorial powers prevail in our state and nation, democracy will fall and our people will become serfs and slaves to their will; then professional men will become puppets to their wishes.

We say it cannot happen here. Why do we believe this? Are we so sure of our strength? Unless we assert ourselves by giving to our clientele the best of medical accomplishment, both preventive and curative, and hold firmly to a feeling of friendship, collaboration and fair dealing with each other, we may find ourselves beset by the danger of having our liberties taken away from us and our opportunities dissipated by circumstances without our control.

It is well that we hold fast to that which has been tried and not found wanting, both in government and medicine.

B. J. Branton, M.D., *President*
Minnesota State Medical Association

EDITORIAL

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BUSINESS MANAGER
J. R. BRUCE

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TRENDS OF DISEASE

MUCH of the present-day news is so depressing that we are inclined to grasp at reports that show favorable trends. And although statistics must be taken with caution, when properly compiled and interpreted they do indicate trends. The statistics put out by the Metropolitan Life Insurance Company meet these requirements and each year the mortality rates of this company duplicate those of the country at large.

During the past thirty years the mortality rate has fallen 40 per cent. This progress is accounted for largely by the cutting down of deaths in infancy, childhood and young adulthood. The decline in mortality rate, however, has been present in all age groups.

The average length of life of all policy holders in this insurance company is sixty-three years, which constitutes a gain of sixteen years in the past thirty years.

One of the most outstanding reductions in death rates has been that in pneumonia. In 1940, this rate was 35.5 per 100,000; in 1939, 42.8; in 1938, 50.6; and in 1937, 66.9. In the past four years the mortality has been cut in half. Serums and drugs are entitled to the credit for this progress.

In the case of tuberculosis the mortality last year was 44.3 per 100,000 compared with 80.9 ten years ago, and 224.6 thirty years ago.

The childhood diseases continued in 1940 to be less of a menace than the year before. The mortality of scarlet fever, measles, diphtheria and whooping cough combined was 2.9 for 100,000, less than that for measles alone ten years ago.

It is pleasing to note, too, that last year there was a decline in the mortality due to appendicitis and puerperal fever.

On the other side of the picture the mortality due to chronic diseases characteristic of middle and later life, namely diabetes, cancer and vascular diseases, has increased. This is to be expected as the proportion of the population in the older decades is increasing.

Doubtless numerous factors account for the improvement in the health of our citizens. Publicity campaigns which call the attention of public and profession alike to the need for taking remedial action play their part. The remedial steps taken in response to publicity campaigns are fully as important. Improvement in public sanitation and control of contagion is without doubt more important in the betterment of public health than all other factors combined.

DR. IKEDA VINDICATED

IN OUR ISSUE for October, 1940, appeared an editorial on the subject of "State Licensure of Laboratory Technicians" by Dr. Kano Ikeda, pa-

thologist at the Miller Hospital in Saint Paul. The editorial, in brief, advocated the continuance of the Registry of Medical Technologists of the American Society of Clinical Pathologists, which has been in operation since 1928 and in which some 6,000 medical technicians have voluntarily met the requirements and registered. He could see no reason for changing to state licensing with forty-eight different standards subject to political influence and control. Reference was also made to the organization known as the American Medical Technologists, composed of technicians not registered with the Society of Clinical Pathologists, which for a fee of five dollars issues a certificate M. T. so like the one issued by the Registry as to be confusing to the uninitiated.

The editorial aroused a spirited response from Dr. R. B. H. Gradwohl of the Gradwohl Laboratories, Saint Louis, in the form of a communication submitted for publication in the journal. Not wishing to present a battlefield for a controversy over the question whether medical technicians and the public weal would be better served by registration in individual states than by continuing the present national Registry of the Society of Clinical Pathologists, we declined space to Dr. Gradwohl's communication. The communication, we are informed, appeared in *The Gradwohl Laboratory Digest* with additional material consisting of a letter to Dr. A. D. Cutter, Secretary to the Council in Medical Education and Hospitals of the A.M.A., making inquiry regarding the authorship of a statement attributed by Dr. Ikeda to Dr. Cutter, and also Dr. Cutter's reply denying his having made such a statement. Copies of this *Laboratory Digest,* according to report, have been widely circulated in Minnesota and perhaps elsewhere in an obvious attempt to discredit Dr. Ikeda and, therefore, his point of view in the eyes of the profession.

When Dr. Ikeda called Dr. Cutter's attention to the latter's statement which appeared in one of his letters to the effect that "the Council was in no position to feel that a state board of examiners in medical technology would represent any advance over present methods of control in this field," Dr. Cutter corrected himself both to Dr. Ikeda and Dr. Gradwohl.

Dr. Ikeda is well known in the Twin Cities where he has acted as pathologist at the Minneapolis General, Saint Luke's and the Miller Hospitals. His activities in trying to raise the standard of training for medical technicians and in combating dishonest advertising on the part of low-grade commercial schools for technicians are nationally known. Any aspersions, therefore, on Dr. Ikeda's honesty and truthfulness are resented and we are glad to give space to explain the facts which led to Dr. Gradwohl's accusations. An admission by Dr. Gradwohl in his *Laboratory Digest* of the error in his judgment of Dr. Ikeda, which opinion has been broadcast in this same *Laboratory Digest,* would serve to undo, in part, the injustice he has done to Dr. Ikeda, and would close this chapter of a controversy which doubtless has two sides and upon which other chapters will doubtless be written in the future.

PREMARITAL EXAMINATIONS

SOUTH DAKOTA, Illinois and Wisconsin now have laws on their statute books which require that those who contemplate matrimony exhibit to the County Clerk of Courts certificates showing that they have recently submitted to tests for syphilis and that the reports show negative reactions. Until this is done, no marriage license can be issued.

As long as States adjacent to those mentioned above have no legislation covering these matters it is easy for those so desiring to evade the provisions of these laws. People living in Sioux Falls, South Dakota, for example, can, and frequently do, go to Luverne, Minnesota, or Rock Rapids, Iowa, a distance of thirty-five miles in either instance and get married without having to pay any attention to the South Dakota law. A recent Associated Press dispatch carrying the date line of Des Moines, January 11, stated that at least 22,000 surplus couples exchanged vows in 1940 in Iowa. A bill to remedy this situation is being introduced in the present Iowa legislature. Such a measure passed the house last session but died in a senate committee.

"This increased marriage business is not very healthful," Dr. Walter L. Bierring, Iowa Health Commissioner and former President of the American Medical Association is quoted in the same despatch as saying. "It dramatizes the need for such legislation in this state."

GILBERT COTTAM

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

PREPAYMENT PLANS FOR MEDICAL SERVICE

Voluntary group medical care is probably the most generally discussed of all civilian projects before the medical profession today.

Many voluntary plans have been started in many parts of the United States, some under private sponsorship and some under the ægis of state and county medical societies. So far none of those which are under medical society management have been in existence long enough to provide much material for judgment as to their worth.

Enabling acts have been obtained in most cases but the acts are so drawn that groups of persons outside of organized medicine may, in nearly all cases, take advantage of them and set up competing group medical plans. Also separate units of medical association members may operate independently under the act. Such, at least, has been the experience to date.

A number of prepayment plans of the contract type have been in existence in various parts of the country for a considerable length of time. Increasingly corporations have been employing part or full-time medical men in behalf of their employes and insurance companies are developing plans for hospital, surgical and medical benefits. More and more attention is being given by state medical associations and their component units to the whole question of prepayment plans for medical service.

For Government Support

Also there is still pressure for government supported compulsory sickness insurance and quite recently even Thomas E. Dewey of New York, defeated candidate for the Republican nomination, with an eye, no doubt, to 1944, quite definitely ranged himself in favor of new plans for medical care for the American people. Whether the arrangement should be compulsory and tax supported he did not say, though he took care to stipulate that medical men should be in control of the service and the patient should have his choice of physician.

Thus top flight politicians are seeing the value of medical care as campaign material and the subject is obviously a live one within and without the ranks of medicine today.

Conference Reports

There is clearly a great need to accumulate and report upon experiences, to date, of all who are now experimenting in prepayment plans for medical service.

This need was recognized at the Chicago National Conference on Medical Services (successor to the Northwest Regional Conference which formerly held its sessions in Saint Paul) with a group of reports under the following titles and speakers—"The Second Year," by Mr. J. D. Laux, executive director of Michigan Medical Service; "Why Are We Waiting," by W. D. Hartman, Macomb, Ill., and "What We Learned From Wisconsin Experiments," by Mr. J. G. Crownhart of Madison, secretary of the Wisconsin State Medical Society.

The second year of the Michigan experiment still finds the project "in the red," according to Mr. Laux. The plan is not yet reaching low income groups and probably will not unless they can be solicited through the large industries. The fact that the Ford Company will remove its entire group from Michigan Medical Service to an insurance company plan, March 1, may mean a setback.

As noted in the February issue, the Wisconsin experiments have been abandoned, and, though figures and facts were not conclusive, it was quite obvious that no ready made public demand existed for such prepayment services.

Trouble in New York

Medical Expense Insurance has been considered carefully in New York and a plan has been worked out under the name of "Medical Expense Fund of New York," which is now in the process of organization under sponsorship of the state and county medical societies concerned. To facilitate the project, enabling legislation was sought and obtained from the state legislature; but, as noted above, the legislation was not limited to projects organized and sponsored by organized medical groups. The result has been, according to the *Westchester Medical Bulletin,* that no less than six prepayment plans are now operating or are in process of organization under the Act. Among them are the Group Health Coöperative, Inc., the American Plan for Medical and Surgical Care, Inc., the Medical Guild Foundation, Inc., the Association for Prepaid Medical Care, Inc., and Associated Health Foundation, Inc., besides the Medical Expense Fund. As a result, it is not unlikely that the whole program will be weakened and discredited before the public. The law, in this case, does not limit or specify the number or kinds of corporations which may attempt to qualify under it except that such a corporation must operate on a nonprofit basis. To date, protests to the State Department of Insurance have been unavailing.

New Jersey's Act

In New Jersey, on the other hand, medical society sponsored insurance is only just being organized; but an enabling act which permits only the state medical association to conduct such insurance has been obtained. The Ohio State Medical Association is hoping to get a similar bill through the Ohio legislature this year. The California State Medical Association is embarked on a big scale plan for voluntary health insurance at low premium; but the efforts of the state medical association to meet the demand by this means may be thwarted before it has had a chance to prove itself by the public demand for compulsory state supported sickness insurance made recently by the governor.

In Illinois

Dr. Hardin of Illinois told the Chicago meeting that in view of these and many other experiences, Illinois would wait for better figures and more complete results. In Illinois there appears to be no great public demand for prepayment plans, and the difficulties of selling such insurance to the people who need it most are clearly enormous.

At the Forefront

It was gratifying to Minnesota delegates to the Conference to find that in two exceedingly important departments, Minnesota seems to be at the forefront among the states.

The Minnesota plan for medical care of all social security and welfare clients was much further developed than in the other states represented, though extension of the plan to the big cities still lags. Mr. Walter Finke, director of the Division of Social Welfare, Dr. H. E. Hilleboe, Chief of Medical Services, and Dr. A. W. Adson, Chairman of the State Medical Advisory Committee, outlined the county function of county medical advisory committees here, and of the state advisory committee which operates as part of the division. Rural services in other states appear to be chaotic by comparison; but in some of the cities, notably Chicago, relief patients are permitted to choose their own physicians, just as they are in rural districts here, and the city welfare board pays the fee.

Center Courses Outlined

With the extraordinary development of medical programs at the University Center for Continuation Study, sponsored and assisted by the Minnesota State Medical Association, as outlined at the Conference by Director W. A. O'Brien, postgraduate medical education in the state has moved far ahead. Center courses afford intensive training for practicing physicians under ideal conditions and they are supplemented to a growing extent by the continuous service provided in the "subject-of-the-month" packets, sent free upon request to any member from association headquarters.

MINNESOTA LEGISLATURE IN SESSION

The 1941 session of the Minnesota Legislature convened on January 7, and is now in full swing. Approximately 1,200 bills have been introduced so far in the Senate and House. The Committee on Public Policy of the Minnesota State Medical Association has reviewed a large number of these bills, some of which directly concern the practice of medicine.

A bill regulating non-profit hospital service plan corporations passed the House of Representatives by a vote of 103 to 6. It has been unanimously recommended for passage by the Senate Public Health Committee, and will soon be up for a final vote on the floor of the Senate. This bill was very carefully considered by the Council of the Minnesota State Medical Association, and should prove very acceptable to the medical profession. Prepaid hospitalization as developed by the Minnesota Hospital Service Association, was started in Saint Paul in 1933, and has grown until today 380,000 persons throughout Minnesota are covered by group hospitalization in this plan.

A bill has been introduced in both the Senate and House to restrict the sale of paregoric to sales made upon the prescription of physician and surgeon. Under existing law, a druggist may sell 2 ounces of paregoric in forty-eight hours to a person without a medical prescription. This loop-hole has made it possible for addicts to go from one drug store to another and purchase unlimited amounts of the drug. This legislation was requested by the Federal Bureau of Narcotics because of the large increase in the sale of paregoric to drug addicts who find it increasingly difficult to obtain morphine and other derivatives of opium.

A bill has been introduced in the House to permit fraternal organizations to furnish medical services to their members and to permit such organizations to enter into contracts with physicians to furnish such medical care. According to legal advice, fraternal organizations cannot, under present laws, designate a physician to furnish medical care to their members. The proposed bill would undoubtedly tend to destroy free choice of physician.

A bill has also been introduced in the Senate and House requiring every motor vehicle using the public highways to be covered by liability insurance in a minimum amount of $1,000 for one injured person, or $2,000 for each accident. Such a law would greatly facilitate the payment of many hospital and medical bills that now go unpaid following accidents. The information available indicates that approximately four out of five motor vehicles do not carry liability insurance.

A bill has been introduced to appropriate money to assist counties employing a public health nurse. A bill has also been introduced to appropriate money for so-called after-care for persons afflicted with Tuberculosis. Both of these bills must first be approved by the Senate Finance Committee and the House Appropriations Committee.

There will undoubtedly be other bills introduced which concern the practice of medicine and they will be carefully scrutinized by your Committee on Public Policy.

Committee on Public Policy,
By: L. L. Sogge, M.D., *Chairman.*

IN THE WASHINGTON HOPPER

To any one, who innocently fancied that military preparedness would occupy the 77th Congress to the exclusion of any but the most pressing civil and domestic measures, the list of new bills looking to the improvement of the national health already introduced will be illuminating.

There are, for instance, three bills introduced by Senator Murray of Montana; the first, to provide federal appropriations for compensation for disability or death of workers from silicosis or other dust diseases; the second, to provide sums as high as $37,000,000 in 1946 and not to exceed $17,500,000 in subsequent years for prevention, treatment and control of tuberculosis to be administered and state plans to be approved by the United States Public Health Service; third, to appropriate up to $3,000,000 in 1943, to be given to the Secretary of Labor to provide more adequate protection to workers and their families from losses caused by disability or death from occupational diseases and to promote prevention and control of industrial conditions hazardous to health. State Plans to obtain aid under this appropriation would have to provide for administration by state labor departments or other agencies charged with administration of labor laws, not by state departments of health.

Tuberculosis, Cancer, Hospitals

Representative Elliott of California has introduced a bill for prevention and control of tuberculosis among migrant workers with an appropriation of $1,000,000 the first year, to be administered by the United States Public Health Service; and Representative Rogers of Massa-

chusetts has introduced a bill to provide $2,300,000 the first year for fostering research relating to cancer and for aid to establish a National Cancer Institute, all under direction of the United States Public Health Service. Besides aid to research projects this bill provides for aid to states, counties, cities or other political subdivisions for improvement and extension of facilities for diagnosis and treatment of persons suffering from cancer or suspected of having cancer, provided that "appropriate professional groups" coöperate with the plans and that preference, so far as treatment is concerned, is given to needy persons.

Representative Fulmer of South Carolina has introduced a bill for construction of hospitals which is identical with the Wagner-George bill for hospital construction introduced in the 76th Congress and passed by the Senate at that session. It was referred to the House Committee on Interstate and Foreign Commerce and died there when the Congress expired.

For Chiropractors

A new attempt to give chiropractors the right to treat injured federal employes entitled to benefits under the United State Employes Compensation Act, has been made in a bill introduced by Representative Toal of California; and Senator Capper of Kansas has once more introduced his bill for establishment and administration of state health insurance plans. This is the perennial sickness insurance bill sponsored by the American Association for Social Security which proposes an appropriation of no less than $50,000,000 for the year 1941 and, thereafter, whatever annual amount may be necessary for its ambitious program. Incidentally, the bill stipulates that *ALL* schools of practice duly licensed within the state shall have the right to furnish the medical benefits under the act.

For Needy, Blind, Cripples, Veterans

Two bills to provide medical and surgical aid to needy blind and to provide for education of all types of physically handicapped children were introduced, respectively, by Representative Patrick of Alabama and Representative Angell of Oregon, the one to be administered by the Social Security Board, the other by the United States Commissioner of Education and state departments of education. Appropriations for care for the blind would be $1,000,000 for the first year; for the handicapped they would be up to $11,580,000.

Representatives from five states have introduced bills for construction of new veterans' hospitals and for enlargement of existing facilities to the tune of 3,350 new beds at a cost of more than $9,000,000.

Reintroduced

H. R. 10,606, the bill to promote national preparedness through physical education, including athletics instruction and guidance in healthful living, died with the 76th Congress but has been reintroduced as H. R. 1074 by Representative Schwert of New York with specific reference to health education eliminated. This bill is sponsored by the American Association for Health, Physical Education and Recreation and proposes a federal appropriation totalling eventually no less that $200,000,000 a year! It carries a most unusual provision to the effect that the scope of activities to be carried on under it may be extended in any state apparently without any limit whatever if the legislature of that state decrees. The administration would apparently remain in the hands of the Department of Education.

To Exempt Students—Purify Streams

A bill to create a division of water pollution control in the United States Public Health Service has been introduced by Representative Spence of Kentucky. Annual appropriations not to exceed $50,000,000 will be made available, if the bill is passed, to prepare comprehensive plans for reducing pollution and improving sanitary conditions of all the navigable waters and streams tributary thereto of the United States; also for grants-in-aid to state or municipalities for construction of necessary treatment works.

Senator Murray also introduced a bill to commission any qualified physician or dentist selected for training under the Selective Service Act in the Medical Reserve Corps and then call him to active service according to the law; also to exempt all medical and dental students from training and service and to exempt such students who are members of reserve components of the land or naval forces, from active service without their consent except in time of war. This bill is identical with one introduced by Senator Murray in the last Congress.

For a Secretary of Health

A bill to establish a Department of Health at the head of which is to be a Secretary of Health, long advocated by the American Medical Association, has been introduced by Representative Pfeifer of New York. The secretary, according to this bill, must be a "member of the medical profession." If the bill is enacted, the Food and Drug Administration, the Bureau of Census, the Division of Vital Statistics, the Freedmen's Hospital and St. Elizabeth's Hospital, the Children's Bureau, all functions of the United States Public Health Service, the Bureau of Narcotics and the Health Department of the District of Columbia would be transferred to this department; also the whole or any part of any bureau, service or other agency of government primarily engaged in fostering or promoting health and sanitation.

In the Offing

That the ensuing weeks will see many more bills relating to health and medicine is a foregone conclusion.

It is certain, for instance, that Senator Wagner will shortly introduce a new bill to make effective a national health program on the scale of the bill he sponsored in the 76th Congress.

This bill, it will be remembered, provided for hospital construction, for compensation for disability wage losses, for expansion of maternal, infant, child health and welfare service, for general public helath services and general medical care. It may well gain impetus, rather than lose it, by direct link with the national defense program.

Announcement has been made, too, of a forthcoming bill to finance health care for every worker in defense industries. It is estimated that the plan would embrace at the start about 10,000,000 persons and the number of beneficiaries will obviously grow to staggering proportions if a truly "all-out" defense program gets under way. It has been suggested by sponsors, that, while the government would pay the bills, the medical care would "probably be rendered by private practitioners so as to avoid any controversy over 'socialized medicine.'"

As this issue goes to press, it is announced that the President will be ready shortly to propose a complete internal defense program for the United States. That program will undoubtedly cover the health of the people as an important adjunct to defense. It is likely to include new recommendations for medical services but physicians have the President's word for it, given in a preëlection speech, that such recommendations will not destroy the independence of the medical profession nor the quality of service they offer to the American people.

"SCHEMING ENTERPRISE"

From the *Washington Post,* February 7, 1941, by Gerald G. Gross, staff correspondent:

Coolly discussing Group Health Association and flinging the remains at prosecution counsel, William E. Leahy yesterday depicted the Federal employes' medical coöperative as a scheming, commercial enterprise which aimed to destroy organized medicine.

The Washington attorney's day in court was one such as law students dream of and their professors set up as models. For two and three-quarter hours, interrupted only by a five-minute recess, Leahy stood before the jury and worked on GHA.

The 20 doctors whom he is defending against the Government's charges of monopolistic practices might have called Leahy's opening statement to the jury an exploratory operation, a self-explaining type of surgery.

His scalpel a strong, unhesitating voice that never faltered during the lengthy speech, Leahy's incisive thrusts laid bare—according to his interpretation to the jury—a corporate body conceived with questionable motives, organized by "haughty and arrogant" men and dedicated to destruction of the hallowed traditions of the medical profession . . .

Speaking extemporaneously and without a note, eschewing a speaker's stand on which he might have leaned to rest his short, stocky frame, the defense lawyer systematically exposed, piece by piece, the alleged frailties of GHA which constitute the framework of the doctors' case of having been impelled in the public interest to challenge the coöperative.

He described Group Health Association, which was launched here in 1937 to furnish medical care on a prepayment basis, as "one of the most carefully conceived schemes ever put in operation," whose objective was to foist a socio-economic experiment upon the District . . .

He described Dr. Raymond E. Selders, a former medical director of GHA, as a doctor to whom local hospitals denied operating privileges because "the ink wasn't dry on his license to practice surgery when he applied" . . .

Leahy charged that GHA today offers little to subscribers and that it is doing 'practically nothing' for HOLC employes, for whom it was originally intended.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

Julian F. DuBois, M.D., Secretary

Minneapolis Physician Pleads Guilty to Criminal Abortion

Re: State of Minnesota vs. Samuel R. Fraker.

On February 21, 1941, Dr. Samuel R. Fraker, 70 years of age, entered a plea of guilty in the District Court of Hennepin County, to an information charging him with the crime of abortion. Following a statement of the facts to the Court by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners. Dr. Fraker was sentenced to a term of not to exceed 4 years in the State Prison at Stillwater, which sentence was suspended upon Dr. Fraker's plea that he was suffering from pernicious anemia, and that he desired an opportunity to live with his daughter in Los Angeles, California. Dr. Fraker's plea was granted by Judge Arthur W. Selover, and the sentence was suspended for a period of 3 years.

Dr. Fraker was arrested on February 11, 1941, following a joint investigation by the Minnesota State Board of Medical Examiners and the Women's Bureau of the Minneapolis Police Department, of the facts concerning the abortion of a 17-year-old Minneapolis girl. At the time of his arrest, Dr. Fraker was maintaining an office at 315-316 Masonic Temple Building, Minneapolis, notwithstanding the fact that on November 4, 1938, his license to practice medicine was suspended for a period of 3 years for immoral, dishonorable and unprofessional conduct growing out of a previous criminal abortion. After Dr. Fraker had been sentenced by Judge Selover he was served with a citation requiring him to show cause why his license as a physician and surgeon should not be permanently revoked. Dr. Fraker was paid $50.00 for his services in performing the criminal abortion.

The Minnesota State Board of Medical Examiners fully approves of the disposition of the case as made by Judge Selover. Dr. Fraker's record discloses that it is futile to keep him out of the abortion racket as long as he remains in Minneapolis. Only two alternatives were available, one, to ask the Court to place Dr. Fraker in prison, and the other to accede to his request for a chance to live with his daughter, particularly in view of the condition of his health and age.

Unlicensed Healer Sentenced to Two to Twenty Years for Grand Larceny

Re: State of Minnesota vs. Mels White, alias Jackson Barnett, alias J. M. W. Barnett, alias Marion Royke, alias Marion Roller, alias Mariano Reyes.

The Minnesota State Board of Medical Examiners is pleased to be able to announce to the medical profession that following some splendid work by L. L. Roerkohl, County Attorney of Houston County, Minnesota, and Sheriff George V. Kelly of the same County, the above named defendant was sentenced on November 19, 1940, by Judge Vernon Gates of Rochester, Minnesota, to a term of 2 to 20 years in the Minnesota State Prison following White's conviction of the crime of grand larceny in the first degree.

County Attorney Roerkohl and Sheriff Kelly discovered that White had obtained $1,400.00 from a resident of Houston County by fraudulently mis-representing that White owned valuable oil lands in Oklahoma and that he needed money to finish drilling for oil. White also fraudulently misrepresented himself as an heir of the late Jackson Barnett, millionaire Oklahoma Indian. Notwithstanding the fact that the crime was committed in May 1939, and was not reported to the County Attorney or the Sheriff of Houston County, until the summer of 1940, Mr. Roerkohl and Mr. Kelly diligently pursued the matter, with the result that White was arrested and convicted by a jury of the crime of grand larceny. Due to the fact that White had been previously convicted of a felony, his sentence was doubled, which should eliminate him from the field of illegal medical practitioners for some time.

According to the records of the Medical Board, White came to Minnesota in the fall of 1934, and located at Winona. Following an investigation made by the Board, White entered a plea of guilty on May 8, 1935, to a charge of practicing healing without a Basic Science Certificate, and was sentenced to pay a fine of $200.00 or serve 2 months in the Winona County Jail. White served the jail sentence rather than pay the fine. In 1936, White was again arrested for practicing healing without a Basic Science Certificate and on October 8, 1936, entered a plea of guilty in the District Court at Rochester, Minnesota, where he was sentenced to a term of one year in the Olmsted County Jail. White's previous record shows that in 1917, he was convicted of carrying concealed weapons in the State of Indiana, and sentenced to serve 110 days at the Indiana State Farm at Green Castle, Indiana. Under the name of Marion Roller, White was convicted at Hudson, Wisconsin, in April 1926, of carnal knowledge, for which he served 7 years, 2 months and 6 days in the Wisconsin State Prison. In 1934, he pleaded guilty at Janesville, Wisconsin, to 2 charges of practicing healing without a Basic Science Certificate. While under arrest in the last case in Caledonia, it was learned that White had obtained $60.00 from a resident of Houston County, for herbs. It was also learned that he obtained $24.00 from a young lady in Houston County for herbs, which he did not deliver.

County Attorney Roerkohl and Sheriff Kelly deserve the highest commendation from the medical profession, as well as the general public, for their fine piece of work in putting out of circulation, one of the most persistent quacks ever to operate in this state. White's long criminal record proves that he has absolutely no respect for any of the laws and that he has made his living for a great number of years by imposing upon the public. We believe it is also a tribute to the Courts that Judge Gates imposed the maximum sentence.

HEALTH REPORT ON UNITED STATES TROOPS

The *Monthly Health Review* for troops in the United States, issued by the Surgeon General's Office, Washington, D. C. for the four weeks ended October 26, 1940, shows that the general admission rate for these troops was 740 per thousand as compared to 566 for the previous month, communicable diseases having been largely responsible for the increase. The rate for the respiratory group of diseases rose to 212.2 from 114.1 for September. Venereal diseases showed a slight decline to 39.1 from 44 for the previous month, being still well above the rate for the same period in the previous year. Two cases of typhoid were reported during the month, one in the Seventh Corps Area and one in the Eighth Corps Area; there was one case of typhus fever in the Fourth Corps Area and one of malta fever in the Ninth Corps Area. The rate for injuries showed an increase over that for September, 119 as compared to 87. The noneffective rate remained low, 21.7. The death rate was 2.61 per thousand. Of the seventy-nine deaths, four were due to adenocarcinoma, one to meningitis, three to tuberculosis, one to pneumonia, two to appendicitis, twenty-three to automobile accidents, twelve to airplane accidents, three to motorcycle accidents, six to suicide, three to homicide and two to drowning.

Dr. and Mrs. Harvey Hatch of Minneapolis are the parents of a son, born February 7.

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Dr. W. W. Moir, Jr., is now in service and is at present stationed at Fort Wayne, Wyoming.

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Dr. S. Marx White of Minneapolis was reëlected president of the Council of Social Agencies for a third term at the twenty-fifth annual election last month.

* * *

Dr. and Mrs. D. Kalinoff and daughter, Helen, are enjoying a vacation in the South, with Biloxi, Mississippi, as their headquarters.

* * *

New president of the Blackduck Golf Club at Blackduck, Minnesota, is Dr. Harry A. Palmer, who was elected at the annual meeting in January.

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A postgraduate course in gastro-enterology was conducted for members of the American College of Physicians at the Mayo Clinic in Rochester, February 10 to 22, under the direction of Dr. Edgar V. Allen.

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Dr. Richard M. Hewitt of Rochester attended a meeting of the Committee on Information, Division of Medical Sciences, National Research Council in Washington, D. C., February 10.

* * *

Fire, starting in an elevator shaft in the basement, recently destroyed Hall's Hospital in Little Falls. There were no patients in the three-story frame structure, which was also the residence of Dr. Elmer E. Hall.

* * *

Dr. William T. Peyton, head of the division of neurosurgery at the University of Minnesota Medical School, will leave about the middle of March on a six-weeks' clinical trip in the East.

* * *

Dr. O. M. Sanderson of Currie took over the office practice of Dr. Walter Henry Valentine of Tracy for two weeks last month, while Dr. Valentine was on vacation.

* * *

Dr. I. H. Kiesling, who has been located in Nashwauk for twenty years, is now a member of the Rood Hospital staff in Coleraine. Dr. Kiesling replaces Dr. J. A. Williams who has located in Hibbing.

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Dr. T. E. Eyres of Pequot is remodeling and enlarging his office-and-residence. His offices will occupy the entire ground floor, while the second floor will be given over to living quarters.

* * *

Dr. C. A. Van Slyke was elected a new member of the board of trustees of the Swift County Hospital Association at the group's annual meeting held in Benson, Minnesota.

Dr. Lawrence F. Richdorf of Minneapolis, who suffered a shoulder fracture, January 12, when he slipped on the ice, is back at his office after spending three weeks in the hospital.

* * *

When the Goodhue and Wabasha County Medical Societies conducted a joint meeting in Red Wing, January 30, Drs. E. N. Cook, E. V. Allen and L. A. Brunsting of Rochester were speakers.

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With the installation of new x-ray equipment, Drs. J. L. McLeod, J. C. Feuling, and J. O. Meyer enlarged their offices in Bovey. The rooms were also redecorated, and made sound-proof.

* * *

Dr. A. R. Ellingson of Detroit Lakes left February 24 for New Orleans, Louisiana, where he is taking a month's course in cystoscopy and x-ray diagnosis at Tulane University Medical School. Mrs. Ellingson accompanied him there.

* * *

Dr. Linus Leitschuh, who has been practicing medicine at Red Lake Falls in partnership with Dr. J. A. Roy, has disposed of his interests to Dr. Frank Petkevitch. Dr. Leitschuh has been called to service in the army.

* * *

Dr. George Friedell, formerly of Russell, Minnesota, has opened offices in Ivanhoe, having purchased the building and equipment of Dr. Alvin Erickson there. Dr. Erickson has been ordered to active service in the United States Army.

* * *

Dr. Stephen Baxter of Minneapolis has been reelected president of the Hennepin County Tuberculosis Association. Dr. W. H. Aurand was elected first vice president, and Dr. Russell Morse was named to the board.

* * *

Dr. and Mrs. E. J. Kepler and Dr. and Mrs. M. N. Walsh of Rochester left February 17 for Montevideo, Uruguay, where Dr. Kepler and Dr. Walsh will attend the second Pan-American Congress of Endocrinology. They made the trip by plane.

* * *

Dr. Janet Sutton, a graduate of the University of Minnesota Medical School, Class of 1940, has become associated with the Itasca Clinic of Grand Rapids-Bovey. She is the first woman physician to locate in Itasca County.

* * *

Two more physicians have been added to the staff of the Hastings State Hospital in Hastings. Dr. R. G. Barnes, an associate of Dr. R. C. Radabaugh in Hastings for the past year, has been named part-time physician on the staff, while Dr. Radabaugh has been named consulting surgeon.

Dr. Carl Eggers, head of the tumor clinic of the Post-Graduate Hospital in New York City, addressed members of the Minneapolis Surgical Society, February 6, at the organization's nineteenth annual foundation dinner held in the Minneapolis club. Dr. James A. Johnson, president of the society, presided.

* * *

Dr. Edgar S. Gordon, associate in medicine and instructor in physiological chemistry at the University of Wisconsin, Madison, was guest member of the faculty for the Continuation Course in Dietetics held February 20, 21 and 22 at the University of Minnesota Center for Continuation Study.

* * *

Two physicians are members of the state legislature. They are Dr. Reuben F. Erickson of Minneapolis, member of the House of Representatives from the Thirty-sixth District, south half; and Dr. Clifford I. Oliver of Graceville, senator from the Forty-eighth District.

* * *

Dr. Isadore Snapper, head of the department of medicine of Peiping Medical College at Peking, China, was a guest of Dr. Irvine McQuarrie of Minneapolis for a few days last month while visiting the University of Minnesota Medical School. Dr. McQuarrie was visiting professor at Peiping Medical College last year.

* * *

Dr. William A. Lange, plastic surgeon in Detroit, Michigan, and a graduate of the University of Minnesota Medical School in 1934, married Mrs. Annie Laurine Dodge in Champaign, Illinois, January 30. His bride is the widow of Daniel Dodge. Dr. Lange is a native of Lake City, Minnesota.

* * *

Dr. Gilbert J. Thomas was elected president of the staff of the Eitel Hospital in Minneapolis at a recent meeting. He succeeds Dr. A. C. Strachauer. Other officers are Dr. A. H. McFarland, assistant chief of staff, succeeding Dr. Walter Ude, and Dr. C. N. Borman, secretary, succeeding Dr. Theodore Stebbins.

* * *

Dr. Henry Silver of Willmar has purchased the practice of Dr. A. H. Borgerson in Sebeka. Dr. Borgerson recently moved to Long Prairie to take over the practice of Dr. M. G. Ericsson, who has moved to Cedar Falls, Iowa. Dr. Silver has been associated with the State Hospital at Willmar.

* * *

Dr. D. W. Pollard, who was recently named permanent superintendent of General Hospital in Minneapolis, has also been named to the position of Minneapolis city physician. In that capacity he will be the examining officer for all city departments and employes whose physical condition may affect their employment.

* * *

Drs. R. H. Creighton and E. C. Andreassen of Minneapolis, who will leave soon for Camp Claiborne, Louisiana, for service with the United States Army, were honored February 20 at a going-away dinner given at the Minneapolis Athletic Club by a group of their associates in the Medical Arts Building.

The Registry of Medical Technologists of the American Society of Clinical Pathologists has moved from Denver, Colorado, to Muncie, Indiana. Since its founding in 1928, Dr. Philip Hillkowitz has been chairman and Mrs. Anna R. Scott, registrar. Dr. Lall G. Montgomery, pathologist of the Ball Memorial Hospital, Muncie, is the newly appointed chairman of the Registry and Miss Carlita R. Swenson, formerly associated with the United States Pharmacopœia of Philadelphia, is the newly appointed registrar with headquarters at Muncie.

* * *

Two Minnesota men are among the ninety-four navy medical officers in the country whose promotions in ranks were approved recently by President Roosevelt. They are Dr. Harry J. Scholtes of Wabasha at Brooklyn, from lieutenant commander to commander; and Dr. Louis H. Roddis of Saint Paul at San Diego, from commander to captain.

* * *

Dr. Walter M. Boothby was in New York City, January 29, to address the ninth annual meeting of the Institute of Aeronautical Sciences on the subject, "High Altitude Flying: Prevention of Anoxemia and Aeroembolism." The article was written in collaboration with Dr. William R. Lovelace. He also attended a seminar on aviation medicine at Yale University in New Haven, Connecticut.

* * *

Dr. Chester A. Stewart of Minneapolis, clinical professor at the University of Minnesota Medical School, has been appointed director of the pediatrics department of the Louisiana State University Medical School in New Orleans. He will go to New Orleans next summer to assume his new post.

Dr. Stewart is a former president of the Hennepin County Medical Society.

* * *

Dr. William R. Lovelace of Rochester addressed a Postgraduate Course in Aviation Medicine at George Washington University School of Medicine in Washington, D. C., early in February. His subjects were: "Physiologic Effects of High Altitude Flying and Rapid Changes in Barometric Pressure," and "Transport of Surgical Patients in Airplane Ambulances; Indications and Hazards."

Dr. Lovelace was honored recently by the Rochester Junior Chamber of Commerce, being given the distinguished service award.

* * *

Alpha Epsilon Iota, honorary and professional sorority for women in medicine at the University of Minnesota, held its annual Founders' Day dinner in the Curtis Hotel in Minneapolis, February 22.

Guest speaker was Dr. Betty Nilsson, a graduate of the University of Illinois and head of the Rajahmundry Hospital in India, who talked on "Women in Medicine in India." Dr. Ruth Boynton was toastmaster.

* * *

Dr. Charles T. Bergen of Blue Earth has taken over the practice of Dr. H. W. Sybilrud of Bricelyn during the latter's service in the United States Navy. Dr.

Sybilrud has reported for duty at San Diego as lieutenant commander of the United States Naval Reserve Corps in the Second Marine Brigade.

A graduate of the University of Minnesota Medical School, Dr. Bergen has practiced at Northwood, Iowa, and at Blue Earth, Minnesota.

* * *

Dr. C. W. Mayo of Rochester was in Wheeling, West Virginia, February 14, to address a meeting of the Ohio County Medical Society on the subject, "Combined Abdominal Perineal Resection." From Wheeling he went to Washington, D. C., to speak at the George Washington University School of Medicine.

He also presented a paper, February 17, at a medical meeting in Newport News, Virginia. His paper was entitled, "Malignancy of the Colon."

* * *

Dr. Emil D. W. Hauser, assistant professor of bone and joint surgery at Northwestern University, addressed the Hennepin County Medical Society, February 3, on "Common Disorders of the Foot Due to Functional Decompensation."

A graduate of the University of Minnesota, Dr. Hauser obtained his Master of Science in orthopedic surgery as a fellow in the Mayo Foundation in 1927, and since that time has lived in Chicago.

* * *

Guest faculty member for the Continuation Course in the Anemias, March 3, 4 and 5, at the University of Minnesota Center for Continuation Study was Dr. William B. Castle, professor of medicine at Harvard Medical School in Boston.

Enrollment was limited to those with special training in internal medicine. The anemias were discussed from the laboratory, experimental and clinical viewpoints.

Dr. Castle also addressed a meeting of the Minnesota Pathological Society, on the University campus, March 4.

* * *

Dr. John P. Hawkinson of Crosby was one of seven fishermen stranded in Minnesota's north woods early last month, when their plane was disabled. The party was rescued by William Leithold, Ely mercy flier, who searched for them by starlight. The party had flown to Lake Gabimichigami, sixty miles east of Ely, to fish. As they prepared to take off on the return trip, one of the plane's skis broke through the ice.

Dr. Hawkinson is mayor of Crosby, and is the newly elected president of the Upper Mississippi Medical Society.

* * *

Medical reserve corps officers who had been ordered to active duty and whose orders have been revoked include:

Dr. George Stanford Atkinson, White Earth, first lieutenant, who had been ordered to Fort Snelling, Minnesota.

Dr. Leo V. James Conlin, Saint Paul, first lieutenant, who had been ordered to Carlisle Barracks, Pennsylvania.

Dr. Kinsey MacLeod Simonton, Rochester, first lieutenant; Dr. Carleton S. Strathern, Saint Peter, first lieutenant; Dr. Alfred Uihlein, Rochester, first lieutenant, and Dr. Louis Dysart Vaugh, Rochester, first lieutenant, all of whom had been ordered to Camp Grant, Illinois.

Dr. C. C. Clay of Minneapolis was in charge of arrangements for a McGill University dinner at the Leamington Hotel, February 13, at which Dr. F. Cyril James, principal of McGill University, Montreal, was guest of honor.

Guests included the following physicians who are graduates of the university: Drs. Peter Ward, A. R. Hall, Alexander Stewart, A. R. Colvin, E. L. Kannary and J. F. Hammond of Saint Paul; Drs. G. L. Evans, Edmund Murphy and George Kennedy of Minneapolis.

Other guests were Drs. John McKelvey, C. W. del Plaine and John Korchik of Minneapolis.

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Dr. Julian F. DuBois of Sauk Center, secretary of the Minnesota Board of Medical Examiners, Saint Paul, and F. Manley Brist, attorney for the Board, presented a paper, "Medical Laws and Their Enforcement," at a meeting of The Federation of State Medical Boards held in Chicago in conjunction with the thirty-seventh Annual Congress on Medical Education and Licensure, February 17 and 18.

Also on the program for the Congress was Col. Leonard G. Rowntree, who was recently appointed Chief of the Medical Division of the Selective Service System, Washington, D. C. Colonel Rowntree was for many years professor of medicine at the University of Minnesota Medical School and chief of the medical division of the Mayo Foundation.

* * *

Speakers at the regional meeting of the Women's Field Army of the American Society for the Control of Cancer, held in Rochester, February 6 and 7, included besides Mayo Clinic staff members:

Dr. A. J. Chesley, secretary of the Minnesota State Board of Health; Dr. William A. O'Brien, president of the Minnesota Society for the Control of Cancer, who gave the principal address at the banquet, "Why Lay Education is Necessary in the Cancer Control Program;" Dr. Gaylord W. Anderson, head of the department of preventive medicine and public health at the University of Minnesota.

Also in attendance were Dr. Max W. Alberts, vice president of the Minnesota society, and Dr. B. J. Branton, president of the Minnesota State Medical Association.

* * *

The value of fraternity life to a medical student was stressed at the forty-third annual Founders' Day dinner, February 18, of Psi chapter, Alpha Kappa Kappa medical fraternity, in the Town and Country Club in Saint Paul.

Principal speaker was Dr. William Mann, professor at Northwestern University and grand president of the fraternity. Other speakers included Dr. Burton J. Branton, president of the Minnesota Medical Association; Dr. Harry G. Irvine, associate professor of dermatology at the University of Minnesota Medical School; and J. Gordon Bateman, president of the chapter. Dr. Irvine presented the organization with a photostatic copy of a picture of the chapter's charter members taken in 1896.

Dr. Max Alberts was toastmaster.

Dr. A. V. Stoesser, associate professor of pediatrics at the University of Minnesota Medical School, addressed a meeting of the Omaha County Medical Society in Omaha, February 11.

Dr. Stoesser also was in South Dakota about the middle of February to address two educational institutes on the medical care of the premature infant. The institutes for physicians and nurses, conducted by the South Dakota State Department of Health, were held in Huron, February 17, and in Rapid City, February 19. Miss Gertrude Carlsrud of the Minnesota State Department of Health, nursing instructor in premature infant care, also participated in the institutes.

* * *

Dr. Henry E. Michelson of Minneapolis will present a paper, May 20, on diseases of the skin, at the annual meeting of the North Dakota State Medical Association to be held in Grand Forks, May 18-21. He will also lead a round-table discussion at a noon luncheon, May 20.

Dr. Michelson has also accepted invitations to address the South Dakota State Medical Association at its meeting in Mitchell, May 19 and 20, and the Nebraska State Medical Association, which will meet in Lincoln, May 5 to 8.

Next November he will go to Oklahoma City to address the Oklahoma City Clinical Conference, November 3-6, 1941, as one of sixteen guest speakers. Approximately 650 doctors from Oklahoma, Kansas, Missouri, Arkansas, Colorado, Texas and New Mexico will participate in this meeting.

* * *

Three Minnesotans participated in the fifteenth annual meeting of the National Conference on Medical Service (formerly the Northwest Regional Conference) in Chicago, February 16.

They were Dr. William A. O'Brien of Minneapolis, director of postgraduate medical education at the University of Minnesota Medical School; Walter F. Finke, director of the Minnesota Division of Social Welfare of the Department of Social Security, Saint Paul; and Dr. Alfred W. Adson of Rochester, chairman of the Medical Advisory Committee to the Minnesota Division of Social Welfare.

Dr. O'Brien participated in a discussion of state medical societies' postgraduate programs and spoke on the subject, "As Carried On in Minnesota; a Coöperative Program."

Mr. Finke and Dr. Adson presented a paper on "Minnesota's Plan for the Care of the Medically Indigent."

* * *

Elizabeth Kenny, Australian nurse who has demonstrated her method of treating infantile paralysis at the Minneapolis General Hospital for the past nine months, sailed recently for her home in Brisbane to assemble a technical staff preparatory to establishment of treatment facilities at the University Hospitals. She will return to Minneapolis in May.

For the past nine months she has demonstrated her method of treatment at General Hospital, working under the supervision of Dr. Wallace Cole, head of the department of orthopedic surgery at the University and now director of the American Hospital in Britain; Dr. John H. Moe, chief of orthopedics at General Hospital; Dr. Miland E. Knapp, chief of physiotherapy at General Hospital, and Dr. John F. Pohl, attending orthopedic surgeon at General Hospital. Her work is partially supported by the National Foundation for Infantile Paralysis.

* * *

Among the twenty-two new Fellows in the Mayo Foundation at Rochester are Dr. John H. Rosenow, son of Dr. and Mrs. E. C. Rosenow of Rochester, who is a graduate of Harvard University Medical School, and Dr. Delmar R. Gillespie of Lakota, North Dakota, who received his M.D. from the University of Minnesota Medical School.

Others are: Dr. Guy W. Daughtery of Fayetteville, West Virginia; Dr. Philip D. Gelbach, Evans City, Pennsylvania; Dr. Julian P. Levinson, Brownsville, Pennsylvania; Dr. Francis R. Manlove, Philadelphia; Dr. Gideon R. Wells, Chicago; Dr. C. Hal McCuistion, Austin, Texas; Dr. J. Wayne McFarland, Los Angeles; Dr. Edward E. Cannon, Chicago; Dr. Edward T. Clarke, Houston, Texas; Dr. Charles V. Demong, Syracuse; Dr. Charles H. Evans, Waddington, New York; Dr. A. Wesley Hildreth, Bay Shore, New York; Dr. Hiram D. Hilton, Lincoln, Nebraska; Dr. Spencer K. Phillips, Freeport, Illinois; Dr. Thomas S. Sexton, Sistersville, West Virginia; Dr. Frederick H. Smith, Ailsa Craig, Ontario; Dr. Henry R. Large, Cleveland; Dr. Samuel M. Brooks, St. Johnsbury, Vermont; Dr. Thomas N. Foster, San Jose, California; Dr. Gustav O. Kruger, Jr., of Washington, D. C.

Dr. Abel N. A. Canonicao, a Rockefeller Foundation Fellow, is working with Dr. F. C. Mann and his associates at the Institute for Experimental Medicine.

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The following medical reserve corps officers have been ordered within the past few weeks to extended active duty:

Dr. Edwin Grimshaw Benjamin, Minneapolis, first lieutenant, to Fort Sam Houston, Texas.

Dr. Harold Clark Johnson, Thief River Falls, first lieutenant, to Fort Sam Houston, Texas.

Dr. Ralph Burnsell Kettlewell, Sauk Center, captain, to Fort Riley, Kansas.

Dr. Frank Lloyd Richardson, Minneapolis, first lieutenant, to Carlisle Barracks, Pennsylvania.

Dr. Byron Lee Gifford, Long Prairie, first lieutenant, to Camp Murray, Tacoma, Washington, and to Randolph Field, Texas, after which he will become flight surgeon with the air corps.

Dr. Henry Burton Grimes, Madelia, major, to Fort Ord, Presidio of Monterey, California.

Dr. John Kenneth Helferty, Tracy, first lieutenant, to Fort Ord, California.

Dr. Jules Owens Meyer, Grand Rapids, first lieutenant, to Fort Ord, Presidio of Monterey, California.

Dr. Joseph Herman Sagi, Minneapolis, first lieutenant, to Fort Lewis, Washington.

Dr. Rosel Theodore Seashore, Minneapolis, first lieutenant, to Fort Ord, Presidio of Monterey, California.

Dr. Donald Edward Stewart, Grand Rapids, first lieutenant to Fort Lewis, Washington.

Dr. David Albert Burlingame, Minneapolis, first lieutenant, to William Beaumont General Hospital, El Paso, Texas.

Dr. Raymond Paul Hawkinson, Robbinsdale, captain, to Fort Des Moines, Iowa.

Dr. Charles King Holmes, Minneapolis, lieutenant colonel, Minneapolis to Hot Springs, Arkansas.

Dr. Abraham Benjamin Rosenfield, Hibbing, captain to Hot Springs, Arkansas.

Dr. Russell Olay Sather, Crookston, captain, to El Paso, Texas.

Dr. Jacob Allan Sheinkopf, Minneapolis, captain, to Hot Springs, Arkansas.

Also Dr. Andrew W. Shea, first lieutenant, Minneapolis; Dr. John Mendenhall Snyder, captain, Rochester; and Dr. Robert Woodruff, first lieutenant, Rochester.

In Memoriam

Edmund Levings Warren

Dr. E. L. Warren, eye, ear, nose and throat specialist of Saint Paul, died February 19, 1941, following a month's illness.

Dr. Warren was born June 26, 1884, in New York City, the son of Mr. and Mrs. Alvah H. Warren. He came to Saint Paul at an early age. He attended the Irving School and later Mechanic Arts and Central High Schools; he graduated from Central High School in 1904.

After two years of academic work at the University of Minnesota he took his medical course at the College of Physicians and Surgeons, Columbia University, graduating in 1910. His internship was taken at the New York City Hospital in 1911 and 1912 and post-graduate work at the Manhattan Eye, Ear and Throat Hospital, New York City.

Dr. Warren passed the state board examinations in New York, Washington and California and practiced in New York and Pasadena before locating in Saint Paul in 1914. He was a member of the executive committee of the Children's Hospital and a member of the staffs of Saint Luke's, Miller, Saint Joseph's and Gillette Hospitals.

An ardent hunter, fisherman and outdoor enthusiast, Dr. Warren periodically wrote articles which appeared in sporting magazines. One trip on horseback into the wilds of the Canadian Rockies after big game and another into the mountains of Idaho provided trophies for Dr. Warren and material for his pen.

Dr. Warren was a member of the Psi Upsilon Fraternity, the Ramsey County Medical Society, and the Minnesota State and American Medical Associations.

Dr. Warren is survived by his widow, Helen Powers Warren, two sisters, Mrs. M. S. Stringer, Saint Paul, and Mrs. R. Kingsland Hay, New York City, and a brother, A. H. Warren, of Pittsburgh, Pennsylvania.

Dr. Warren had the distinction of having had a tracheotomy performed on him for membranous croup in infancy by Dr. Jacoby of New York. He, himself, used to tell of performing an emergency tracheotomy with his pen knife on a fellow traveler on a train bound for the west before he had passed his state board examinations. The cap of his fountain pen was used for a tracheotomy tube.

Possessed of an unusual kindliness of heart, Dr. Warren was blessed with many close friends both within and outside the profession.

William David Beadie

Dr. William D. Beadie, formerly superintendent of Mineral Springs Sanatorium, Cannon Falls, Minnesota, died at Windom, Minnesota, on February 7, 1941.

Dr. Beadie was born in Toronto, Canada, on June 15, 1874. His parents were both natives of Scotland. When he was thirteen years of age he moved with his family to Lachine, a suburb of Montreal. He attended school there and took his medical course at McGill University, where he graduated in 1900.

After graduating from McGill University Medical School, Dr. Beadie came to Windom, Minnesota, where he practiced general medicine until 1910. In 1910 he moved to Saint Paul and practiced general medicine there until 1917. In 1917 he was made superintendent of Pokegama Sanatorium. In 1923 he took the position of superintendent at Mineral Springs Sanatorium. He held this position until he resigned on account of illness at the end of December, 1940. During his régime Mineral Springs grew from a two-county to an eight-county institution largely through his efforts.

In December Dr. and Mrs. Beadie moved to Windom to be with Mrs. Beadie's sister, Miss Margaret McGregor.

Dr. Beadie married Elizabeth McGregor of Windom, October 21, 1903. Mrs. Beadie and a son, William, of Saint Paul and two grandsons survive.

During his residence in Saint Paul Dr. Beadie was a member of the Ramsey County Medical Society and later became a member of the American Trudeau Society and the National Tuberculosis Association.

When Dr. Beadie was forced to retire as superintendent of Mineral Springs Sanatorium because of illness, the December issue of the *Sanscript,* the publication of the sanatorium, was devoted to his praise. This must have been a source of real satisfaction to him. Perhaps "perfect gentleman" best described Dr. Beadie in the eyes of his many friends.

John P. Hiebert

Dr. John P. Hiebert, Minneapolis, died October 11, 1940, at the University Hospital.

Dr. Hiebert was born at Mountain Lake, Minnesota, in 1876. He obtained his medical degree at Northwestern University Medical School in 1905, and began practice in Minneapolis in 1914. He was Chief of Staff at Asbury Hospital in 1938 and was a member of the Eitel, Abbott and Asbury Hospital staffs. He was active in practice until two weeks before his death.

Dr. Hiebert is survived by his wife, three brothers and four sisters.

MEDICAL BROADCAST FOR MARCH

The Minnesota State Medical Association Morning Health Service.

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

March 8—Records of Birth
March 15—Life's Increasing Span
March 22—Diseases of Middle Life
March 29—Orthodontia

DR. SCUDDER TO SPEAK AT ROCHESTER

Dr. John Scudder of the Columbia University College of Physicians and Surgeons in New York City, who will come to Minneapolis to address the regional meeting of the American College of Surgeons, March 10, 11 and 12, will also lecture in Rochester.

He will speak there, March 6, on the subject, "Blood Studies in Shock as a Guide to Therapy."

CLARENCE M. JACKSON LECTURE

The Clarence M. Jackson lectureship, established by Phi Beta Pi medical fraternity, will be delivered by Dr. Carl R. Moore, chairman of the department of zoölogy at the University of Chicago, March 19, at the University of Minnesota.

His subject will be "The Significance of Hormones in Embryonic Sex Differentiation."

JOHN PHILLIPS MEMORIAL AWARD, 1941

The Board of Regents of the American College of Physicians has awarded the 1941 John Phillips Memorial medal to Dr William Christopher Stadie, Associate Professor of Research Medicine at the University of Pennsylvania, for his contributions to the knowledge of anoxia, cyanosis and the physical chemistry of hemoglobin, and more especially for his recent studies on the subject of fat metabolism in diabetes mellitus.

The recipient will present the work mentioned at the next annual session of the college.

STATE MEETING

Surgery of trauma will be the general subject of an entire day's program to be presented in connection with the 88th Annual Meeting of the Minnesota State Medical Association, May 26, 27 and 28, at the Saint Paul Auditorium.

For this program, scheduled for Tuesday, May 27, surgeons of all Northwest railways will join with the Association, and several outstanding guest speakers have been invited to participate. The Great Northern Railway Association will hold its own annual sessions in Saint Paul on the day preceding so as to be present for this program.

Emphasis in selection of all subjects and speakers has been placed, according to the Committee on Scientific Assembly, on the special interests and needs of the general practitioner.

Round-table luncheons are being arranged for each day of the meeting and an Open House and "Gay Nineties" show will be held in the exhibit hall Monday night. Tuesday night will be devoted to the annual banquet of the Association.

Among distinguished visiting speakers already scheduled for the three-day meeting are Dr. Edward D. Churchill, John Homan, professor of surgery at Harvard, who will come under the sponsorship of the Saint Paul Clinical Club; Dr. H. H. Kessler of Newark, N. J., and Dr. Walter Simpson of Dayton, Ohio, who is sponsored by the Northern Minnesota Medical Association.

Physicians from all the Northwest states will be invited to attend the sessions.

CLINICAL RESEARCH CLUB

A new organization at the University of Minnesota Medical School is the Clinical Research Club, which will become affiliated with the newly organized American Federation for Clinical Research. An organization meeting of the federation, which is to be a society of young men and women interested in and carrying on clinical investigation, is to be held May 5 in Atlantic City, New Jersey.

Dr. John A. Layne is chairman of the University of Minnesota Club. Members of the advisory board are Dr. John Anderson, pediatrics; Dr. Clarence Dennis, surgery; Dr. Robert Hebbel, pathology.

Meetings will be held the first Monday of each month.

MINNESOTA DERMATOLOGICAL SOCIETY

The twenty-fifth anniversary of its founding was celebrated February 22 by the Minnesota Dermatological Society with a clinic at the University Hospitals in Minneapolis and a dinner at the Minneapolis Club. Members of the Chicago Dermatological Society were guests.

Honored at the dinner were founders of the organization, which is one of the older dermatological societies of the country. Founders include Drs. John Butler, Samuel E. Sweitzer and Clifton A. Boreen of Minneapolis; Drs. Charles D. Freeman, John M. Armstrong and Henry N. Klein of Saint Paul.

Speakers were Dr. Sweitzer, who presented the history of the organization; Dr. J. H. Mitchell of Chicago, who discussed the activities of the society's nearest

neighbor, the Chicago Dermatological Society; and Professor Morris Oppenheim of the University of Chicago, and formerly of Vienna. He discussed the old Vienna clinics.

The Minnesota Dermatological Society, which has had a big influence in the shaping of dermatological thought of this part of the country, is composed of members from the Twin Cities, Duluth, Rochester. The Society conducts monthly clinical sessions. A special meeting is held during the summer in Rochester, Duluth or Winnipeg.

Dr. Henry E. Michelson of Minneapolis and Dr. Francis W. Lynch of Saint Paul were in charge of arrangements for the twenty-fifth anniversary meeting.

DU BOIS ELECTED FEDERATION PRESIDENT

At the annual meeting of the Federation of State Medical Boards, held at Chicago on February 17 and 18, 1941, Dr. Julian F. Du Bois of Sauk Center, Minnesota, was unanimously chosen as president-elect of the Federation. Dr. Du Bois will succeed Dr. J. Earl McIntyre of Lansing, Michigan, president of the Federation during the present year.

All state medical examining boards are eligible for membership in the Federation, and at the present time, thirty-nine states are represented in its membership. The purpose of the Federation is to keep itself and its members informed concerning the medical and other healing art practice acts of the various states and of foreign countries. Consideration is given, from time to time, of suggestions made relating to medical education and licensure. It sponsors a program each year in which the various problems confronting the medical examining boards of the various states, are discussed. The guest speaker of the Federation banquet this year was Ray Lyman Wilbur, M.D., president of Stanford University and chairman of the Council on Medical Education and Hospitals of the American Medical Association. Dr. Wilbur will be remembered by many members of the medical profession as Secretary of the Interior in the Cabinet of former President Hoover.

The Minnesota State Board of Medical Examiners has been very active in the Federation since its organization twenty-seven years ago, and the selection of Dr. Du Bois, in addition to being a personal tribute to him, brings further honor to the medical profession of Minnesota and to the Minnesota State Board of Medical Examiners. Dr. Du Bois was first appointed a member of the Minnesota State Board of Medical Examiners by former Governor Theodore Christianson. In 1935 he was made secretary of the Board and he has acted in that capacity since that time.

BROWN-REDWOOD MEDICAL SOCIETY

Members of the Brown-Redwood Medical Society and the Women's Auxiliary held an annual dinner at Springfield, January 29.

Dr. H. Mortensbak of Hanska is president of the society. Other officers are Dr. E. J. Wohlrabe, Springfield, vice president, and Dr. O. B. Fesenmaier of New Ulm, secretary-treasurer.

FREEBORN COUNTY MEDICAL SOCIETY

Dr. A. Gullixson of Albert Lea was elected president of the Freeborn County Medical Society at its annual meeting, February 5, in Albert Lea. Other officers are: Dr. Paul Gamble, vice president; Dr. L. R. Prins, secretary; Dr. D. L. Donovan, treasurer.

SCOTT-CARVER MEDICAL SOCIETY

Dr. C. C. Chatterton of Saint Paul and Dr. Malvin Nydahl of Minneapolis addressed the Scott-Carver Medical Society, February 11. Dr. Chatterton spoke on "Fractures of the Elbow" and Dr. Nydahl explained the "Functions of the Crippled Children's Bureau."

Dr. Francis Lynch of Saint Paul addressed the society in December. His subject was "Treatment of Common Skin Disorders."

UPPER MISSISSIPPI MEDICAL SOCIETY

Dr. John P. Hawkinson of Crosby was elected president of the Upper Mississippi Medical Society at the organization's winter meeting. He succeeds Dr. Nesmith Nelson of Brainerd.

Other officers named are: Dr. R. A. Murray of Aitkin, first vice president; Dr. C. W. Vandersluis of Bemidji, second vice president. Dr. G. I. Badeaux of Brainerd was reëlected secretary-treasurer.

Dr. B. A. Smith of Crosby and Dr. Badeaux were selected delegates to the State Medical Association meeting, while Dr. A. M. Watson of Royalton, and Dr. John Thabes, Jr., of Brainerd were named alternates.

Dr. Smith was reëlected for a three-year term on the board of censors. Other board members are Dr. W. W. Will of Bertha and Dr. John Thabes, Sr., of Brainerd.

The spring meeting of the group will be held in Aitkin, the summer meeting in Bemidji, the fall session in Little Falls, the election meeting next year in Brainerd.

WASHINGTON COUNTY MEDICAL SOCIETY

The regular monthly meeting of the Washington County Medical Society was held on February 11 at the Stillwater Club rooms, Stillwater, Minnesota. Dr. John M. Culligan of Saint Paul, guest speaker, showed and interpreted slides of x-ray pictures of intravenous and retrograde pyelograms. Dr. D. A. Dukelow, Director of Public Health Education, State Board of Health, spoke about the packets sent by the Minnesota State Medical Association.

WOMAN'S AUXILIARY

Mrs. M. A. Nicholson, Duluth, Minnesota, *President*
Mrs. E. V. Goltz, 2259 Summit Avenue,
Saint Paul, *Publicity Chairman*

Headquarters for the Woman's Auxiliary at the annual meeting of the American Medical Association in Cleveland, June 2-6, 1941, will be the Hotel Carter. Reservations should be made with Dr. E. F. Kieger, Chairman Housing Committee, 1604 Terminal Towers Building, Cleveland, Ohio.

State Board Meeting

The mid-winter meeting of the State Auxiliary Board was held in Saint Paul, February 4, at the Commodore Hotel with Mrs. Harry Ghent, Saint Paul, as social chairman. A large group of members attended the business meeting which was held at 9:30 a. m., followed by luncheon at noon and an afternoon session. The state president, Mrs. M. A. Nicholson of Duluth, presided and heard reports from the various county presidents. Dr. William O'Brien spoke at the morning session on "The Control of Cancer." At the luncheon meeting, Mrs. Howard A. Overman of the state committee of the Women's Field Army for the Control of Cancer, also spoke on the subject. Plans for the annual state meeting to be held in Saint Paul in May were discussed and the following nominating committee was named: Mrs. E. M. Hammes, Mrs. Wm. Robert, Mrs. L. Dack, Mrs. A. C. Baker, and Mrs. H. P. Fischer.

Clay-Becker County

Newly elected officers of the Clay-Becker Medical Auxiliary include Mrs. O. O. Larson, Detroit Lakes president; Mrs. C. W. Simmison, Hawley, vice president; Mrs. L. H. Flancher, Lake Park, secretary-treasurer. The Auxiliary, which numbers twelve members, sponsored a sale of articles by the patients of Sand Beach Sanatorium, clearing $93.59. On January 24, Dr. Charles B. Craft talked to the P.T.A. on cancer, a meeting which was open to the public and sponsored by the Auxiliary.

Hennepin County

Members of the Hennepin County Auxiliary enjoyed colored movies of a trip to Guatemala which were shown by Mrs. Harvey Nelson at their recent meeting. Mrs. H. B. Sweetser was chairman for the tea which followed the program and Mrs. Martin Aune and Mrs. J. R. Peterson poured. Assisting members included Mrs. James Blake, Jr., Mrs. A. C. Kirkhoff, Mrs. Robert Quello and Mrs. R. F. McGandy.

A net amount of $1,203 was realized through the sale of articles made by patients at Glen Lake Sanatorium. The proceeds were turned over to the patients.

Mower County

Mrs. Paul Leck of Austin entertained the Mower County Auxiliary at a dessert luncheon January 28. Following the business session, Mrs. C. L. Sheedy read a paper pertaining to the future practice of medicine. A social hour at bridge followed. Mrs. J. E. Eckdale of Lyle, a prospective member, was a guest.

Red River Valley

The Red River Valley Auxiliary were guests of Mrs. W. E. Mercil the evening of December 3, following the dinner meeting of the Medical Society at which they were guests. There were fourteen members present including several out-of-town members. At the business meeting reports were received on the tuberculosis essay contest for which the auxiliary provides cash awards. Out-of-town guests included Mrs. D. V. Boardman, Mrs. E. Haugseth of Twin Valley and Mrs. W. H. Hollands of Fischer and Mrs. A. Shedlov of Fosston.

Rice County

Rice County Medical Auxiliary held a meeting January 16 at the home of Mrs. S. B. Haessly in Faribault. Miss Muriel Young, visiting nurse, was a guest. The afternoon was spent in knitting and sewing for the Rice County chapter of the Red Cross followed by tea and a social hour.

Upper Mississippi

Upper Mississippi Medical Auxiliary recently elected the following new officers: Mrs. A. E. Amundson, Little Falls, president; Mrs. H. W. Lee, Brainerd, president-elect; Mrs. J. P. Hawkins, Crosby, vice president; Mrs. Douglas Johnson, Little Falls, secretary. Mrs. Lee was reëlected treasurer and Mrs. George Halladay acting secretary for the remainder of this year. Following the business meeting held at the Ransford Hotel, a dinner was served for twenty-one. Mrs. Nesmith Nelson, retiring president, presided. After dinner two essays were read by the winners in the Tuberculosis Essay Contest.

PHYSICIANS WANTED FOR CCC DUTY

Physicians are needed for the medical service of the Civilian Conservation Corps. The initial salary is $3,200 per annum. No quarters for families are provided, and the physicians are required to pay for their food at camps. Temporary quarters for physicians are provided at the camps for a nominal fee. Physicians selected for this service are required to pay their own travel expenses to the headquarters of the district in which they are to be employed, where they are put on temporary duty for instructional purposes before being sent to camps. Travel expenses incurred in the transfer of physicians from the district headquarters to camps or in transfer from one camp to another are paid by the Government.

The principal duties at camps consist of the medical care of the enrollees and the practice of preventive medicine. To be eligible for this service, the physician must be a citizen of the United States, a graduate of an accredited medical school authorized to confer the degree of doctor of medicine, licensed to practice medicine, and physically able to perform the duties involved. Physicians sixty years of age or over will not be employed.

All physicians interested in this type of service are requested to submit their applications to the Office of the Surgeon, Headquarters Seventh Corps Area, Federal Building, Omaha, Nebraska, giving date on which available and preference of assignment in the following states: Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Missouri, Kansas, and Arkansas.

It is requested that young physicians not now listed in the American Medical Directory be informed of this service.

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, October 3, 1940

PRESIDENT JAMES A. JOHNSON, M.D., in the chair

SECRETARY R. F. McGANDY, M.D.

INGUINAL HERNIA FOLLOWING ABDOMINAL SURGERY*

MARTIN NORLAND, M.D.
Minneapolis

UNSATISFACTORY RESULTS FROM THE INJECTION TREATMENT OF HERNIAS COMPARED TO SURGICAL REPAIR*

HARVEY NELSON, M.D.
Minneapolis

COMPLICATIONS ASSOCIATED WITH THE TREATMENT OF HERNIA†

Injection versus Operative Treatment

CARL O. RICE, M.D.
Minneapolis

It has been difficult to evaluate the benefits of the injection treatment of hernia as compared with the surgical treatment because, there is no doubt, the two series of cases are different, or if they are not, they should be. It is true that many cases which are suitable for operation are not suitable for injection. For that reason, among others, many of the opponents of the injection treatment prefer to dismiss injection treatment by merely stating that, if it is of no value for the cases that cannot be operated, then it has no value at all. Such a contention, of course, is erroneous.

By presenting the complications and sequellæ which occur with each method of treatment, I hope to show that the injection treatment of hernia should have a place in our surgical armamentarium.

Of 300 patients who consulted me for examination and advice, 215 (71.6 per cent) were advised that injection would be satisfactory. One hundred sixty-eight (56 per cent of the total) returned and received a full course of treatments, namely, were treated until cured or until they were convinced they could not be cured.

All complications and sequellæ were carefully recorded in these cases and are listed in the accompanying table.

COMPLICATIONS AND SEQUELLÆ FROM INJECTION TREATMENT

	Cases	Per Cent	
None	126	75	
Sterile Abscess	4	2.3	
Allergic Reactions	4	2.3	8.3
Anaphylactic—2			
Urticarial—2			
Vein Punctured (No hematoma)	6	3.7	
Induration of Cord	10	5.9	
Soreness	16	9.5	
Omentum in Sac	1	.7	
Deaths	None	None	

It is seen from these figures that in 8.3 per cent of the cases an undesirable and potentially dangerous reaction occurred. The other sequellæ were of no serious consequence and did not add to the risk of treatment.

Induration of the cord indicates an excessive reaction to the injection fluid, but usually assures a cure.

Soreness as experienced in 9.5 per cent of the cases was of no serious consequence, and probably indicates only a lesser degree of tolerance to pain than most individuals experience.

In the one case in which the omentum could not be reduced from the hernial sac after injections had been started it became necessary to discontinue the treatment. This in no way added to the risk of treatment, nor to the difficulty of a subsequent operation.

The details of the end-result in these cases will not be dealt with in this paper, but I can definitely state that seventeen (15 per cent) of these failed to obtain a cure. The causes of failure were as follows:

Obesity	8
(Six of these had been advised against injection, but decided to try it anyway.)	
Postoperative Cases	4
(Three had been advised against treatment.)	
Omentum in Sac	1
Became Allergic	2
Lack of Coöperation	2

Strangely, fourteen physicians (9 per cent) were included in this group of 168 patients. Five were advised against the treatment, but preferred to try it. There was failure in three of these.

This series may be compared with a somewhat larger group of 868 patients who were seen at the Minneapolis General Hospital, upon whom 555 operations were performed. The following complications occurred.

COMPLICATIONS FOLLOWING OPERATION

	Cases	Per Cent	
Primary Healing	389	70	
Abscess	3	.5	27.3
Stitch Infection	5	.9	
Wound Break Down	19	3.4	
Serous Exudate	64	11.4	
Wound Infection	31	5.4	
Bloody Exudate	22	4.1	
Hematoma	11	2.0	
Induration of Wound	6	1.1	
Ecchymosis	2	.4	
Deahts	5	.9	

*Presented at the meeting but not submitted for publication.

†Assistance in the preparations of these materials was furnished by the personnel of Work Projects Administration, Official Project No. 65-1-71-140, Sub-project No. 361.

It is true that most of these 555 operations were performed by house physicians whose experience is not as great as that of the staff surgeons, but the fact that 27.3 per cent of the operated cases developed undesirable local wound reactions is in itself quite alarming. The remaining 1.5 per cent of local wound sequellæ were not particularly serious.

In addition to these local complications a certain number of patients also developed systemic complications which probably would not have occurred had the patient not been operated upon. These are as follows:

SYSTEMIC COMPLICATIONS FOLLOWING OPERATION

	Cases	Per cent
Pneumonia	20	3.6
Bronchitis	12	2.1
Cough	31	5.6
Thrombophlebitis	1	.18
Embolism	4	.7
Empyema	5	.8
Intestinal Obstruction or Paralytic Illeus	32	5.7
Pulmonary Edema	9	1.5
Shock	6	.9
No systemic complications	435	78

Though I cannot give in this preliminary report the figures relative to the seriousness of the condition of these patients before operation, I do not wish to leave the impression that all of the hernias were uncomplicated. Neither were all these patients poor surgical risks. A more detailed report will be made later. I wish only to call attention to the fact that hernia surgery is not as simple as we are sometimes led to believe.

I do desire to emphasize that the incidence of complications and sequellæ following operations for hernia are not less than those following injection. It seems that it is justifiable to conclude that with proper selection, the injection treatment of hernia does have a place in our surgical armamentarium.

Discussion

Dr. Martin Nordland: Is there any percentage of sterility following injection treatment?

Dr. Carl O. Rice: As far as it has been possible to determine, there have been no cases of sterility nor atrophy of the testicle resulting from the injection treatment of hernia. Dr. Charles Rea has made a study of this, and was unable to find a higher incidence of aspermia in bilaterally injected individuals than in an uninjected group of individuals. We all have no doubt seen cases of testicular atrophy following herniaplasty. I have never observed one following the injection treatment for hernia.

Dr. James M. Hayes: Can injection treatment be used in postoperative hernia or with old men who have weakened abdominal walls?

Dr. Rice: I do not choose to treat postoperative hernias. Sometimes patients insist that I try, even though I advise against it. If such is the case I see no harm in trying. In a few instances I have been successful, though I do not recommend it. The sooner we learn the contraindications for injection and the more accurately we adhere to them, the quicker we will be able to place the injection treatment in the catagory to which it belongs. A relaxed abdominal wall in an old patient is not in itself a contra-indication for the injection treatment.

FIBROMA OF THE VAGINA

Report of Case

Ivar Sivertsen, M.D.

Minneapolis

Dr. George Ernest Herman states in his book on "Diseases of Women" that fibroids of the vagina are so rare that no one can describe them from actual personal experience. He quotes John Phillips: "that an account of them must be based on collections of them in books and case reports."

William Esterly Ashton, in his textbook on "Practice of Gynecology" gives a very good description of the condition but states that the cause is unknown.

Dr. Frank Lynch in his monograph "Pelvic Neoplasms," states that fibromyoma of the vagina rarely originates in the vagina, and that up to 1886 only six cases were collected; and quotes Smith, in 1902, that 100 cases had been collected; Potel, in 1903, extended the list to 150 cases; Müller, in 1914, and Geisecke in 1915 made careful studies and the latter author cites 196 cases.

Dr. Hamlin Mattson, of our city, who reported a case in October, 1934, in the *Journal of the American Medical Association*, of such a tumor, states that about 200 of these cases have been reported in the literature, quoting W. P. Graves for this statement.

In studying these cases it might be wise to review briefly the anatomy as well as the anatomical relations of the vagina.

The vagina extends from the vulva upwards and backwards for about three inches. Its anterior wall measures only about 2 inches, whereas the posterior wall measures 3 inches.

There are two layers of muscles, an internal circular one, and an outer longitudinal. There is no true sphincter for the vaginal orifice, but the anterior fibers of the levatorani and the superficial perineal muscles act as a sort of sphincter.

The naked eye appearance of the vaginal wall shows transverse rugæ, and these are seen both on the anterior and the posterior aspects. Microscopically, the mucosa consists of connective tissue papillæ which are covered by several layers of squamous epithelium and has no mucous glands or ducts. The vaginal secretion is a transudation from the blood vessels mixed with mucus which is secreted by the cervix. The presence of the bacillus of Döderlein causes an acid reaction of the vaginal secretion. The vaginal portion of the cervix also consists of squamous cell epithelium.

The anatomical relations of the vagina are as follows: In front the vaginal wall is in relation to the urethra and the neck of the bladder, and hence a sound or catheter passed into the urethra is distinctly felt through the anterior vaginal wall. The neck of the bladder is also palpable through the anterior vaginal fornix, and it is possible that a body, such as calculus or tumor in the bladder, can be recognized on bimanual examination.

Behind, it is separated from the anus by the perineal body, above which we find the recto-vaginal septum. Foreign bodies or feces in the rectum are easily felt through the posterior vaginal fornix and wall.

Vaginal tumors are very rare. The most common tumor of the vagina is the cysts, and next in order is the fibroids. Carcinoma is probably never primary. Sarcomata are, at times, seen in children, and secondary nodules of chorio-epithelioma, and even tuberculosis nodules have been described.

Most authors agree that the etiology of fibroids is unknown. Some authors have explained them on the same basis as uterine fibroids and adenomyomata. Most of these cases occur in the third or fourth decades of life, although they have been occasionally reported in children.

Classification.—Fibroid tumors having their origin in the uterus, which have grown down into the connective tissue and forced their way into the vagina, are excluded from this classification. Also pedunculated growths in the cervix that become adherent to the vaginal wall do not belong in this group.

Location.—True vaginal fibroids develop mostly on the anterior vaginal wall, though cases have been found rarely on the posterior wall.

Form, Size, and Appearance.—Most authors agree that these tumors are usually single, although apparently multiple fibroids have been reported. They appear as hard, round, nodular tumors, usually of small size, although larger tumors have been described, the average size being one or two inches in diameter. One fibroid has been reported that weighed 625 grams. They grow from beneath the mucus membrane of the vagina and are frequently pedunculated, though sessile tumors are more frequently described. They are covered by a fibrous capsule and on the anterior surface the mucus membrane of the vagina covers the tumor mass. Ulceration of the mucus membrane is often seen, due to irritation from friction, etc.

Histologically, the picture is much the same as that found in fibroids of the uterus, and are made up of smooth muscle bundles and connective tissue in variable proportions and more or less fibrous tissue.

Degeneration, which takes place in fibroid tumors of the uterus, has been noted also in the vaginal type of fibromata.

Effect of Pregnancy.—If pregnancy occurs, these growths may enlarge tremendously, much the same as is seen in uterine tumors.

Symptoms.—If the growths are small, there are no symptoms noted and the mass may be found during a routine physical examination. If, however, the tumor is large, the patient will complain of a swelling in the vagina, and may have some discharge, mucoid or even bloody, depending upon the presence of ulceration. Bearing down pains or symptoms due to pressure, especially upon the bladder or rectum, are present in the larger growths. In the presence of a tumor of any size, dyspareunia is common, and sexual relations are not possible.

Diagnosis.—It would appear that the diagnosis should be simple, but at times it may be very difficult, due to its rarity. If the tumor is so large that it distends the vagina it is not possible to ascertain the site of the growth and it may be difficult to differentiate it from a vaginal cyst.

Treatment.—This is surgical and offers no difficulty, as a rule. If the mass is pedunculated, it is very easily removed, after which the vessels are ligated and the vaginal edges are brought closely together.

The prognosis is always good. These tumors do not recur.

Case Report

Mrs. L. E. N., a housewife, forty-six years of age, came for examination relative to a laceration she believed she had received at the birth of her last child eleven years before. She had no complaint except that a mass seemed to descend into the vagina on voiding. She had no urinary symptoms and no pain. There was some inclination to constipation. She had noticed no discharge.

The family history was negative and aside from a gall-bladder attack several years previous her past history was irrelevant.

Examination showed a fairly well-nourished woman of 112 pounds, somewhat pale. Her blood pressure was 164-90, temperature 99.6, pulse 124. There appeared to be a widening of the palpebral fissures. No murmurs were heard in the heart and the lungs were normal.

Menstrual history had been normal, two pregnancies had been carried to full term and there had been no abortions. On pelvic examination there was a tumor about the size of a large orange protruding from the anterior vaginal wall. The urethra was pushed down and seemed outside of the tumor. The mass was completely outside the labia and it was with some effort that it was pushed back into the vagina. There was an old laceration, grade 2, of the perineum. The uterus seemed normal in size and was freely movable. The adnexa were normal. Large vessels were apparent on the anterior wall of the vagina.

Radiograph of the bladder region showed no evidence of calculi. A rounded area of density was seen above the pubic bone, the tumor having been pushed into the vagina for this examination.

Due to our inability of making a diagnosis, consultation was asked, and Dr. Meland examined the patient on May 2, 1940. Cystoscopic examination was made and Dr. Meland gives the following report: "There was a large mass in the anterior wall of the vagina, which presented through the introitus. The size of the mass was that of a small grapefruit. The urethral orifice is eccentrically placed on the left anterior surface of the mass. Catheter could be passed without difficulty. Following this the patient was cystoscoped. The urethra was somewhat tortuous but was not involved by extension from the growth. Bladder was normal. Both ureteral orifices were normal. Diagnosis: Tumor of the vaginal wall which has not invaded the urethra."

Blood examination showed: hemoglobin 84%, red blood count, 4,400,000; white blood count, 9,000. Meinicke negative. The urin was normal on examination.

Operative Procedure: Incision was made longitudinally below the urethra down toward the cervical

area, through the mucous membrane and fascia, after which the mass was removed by scissors and blunt dissection. The bleeding vessels were clamped and ligated. About 2 inches of the mucous membrane of the anterior vaginal wall were removed, after which it was sutured transversely in two layers. A small catgut drain was laid in the upper angle, and the vagina was packed with small iodoform gauze.

The tumor measures 5.5 by 7 cm. and weighed 110 grams.

Pathologic report: Fibromyoma, benign.

The patient remained in the hospital from May 7, 1940, to May 20, 1940. The wound was entirely healed, and she has had no recurrence nor difficulty.

I wish to express my gratitude to Dr. Ernest Meland, Dr. Skjold, and Dr. Baker, for their interest in the preparation of this report.

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Discussion

Dr. J. M. Hayes: I have been much interested in the injection method of treating hernias ever since Drs. Bratrud and McKinley started this method at the University about ten years ago. I was there on alternate days with these men and started to do the injections about the same time. While I have not been so enthusiastic about this procedure as they have, I do believe it has a place in the treatment of hernia.

I have used injections for certain classes of cases during these ten years. There is no doubt but what there is a high rate of recurrence.

Injections do work well in children when properly done, but the time required and the need for repeated injections often prove objectionable. For men who have a job and do not desire to lay-off long enough for operation, this method is quite satisfactory. They may come to the office and be injected and go back on the job without losing time. When the hernia seems cured, they are discharged and told to come back any time there seems to be the slightest recurrence. If there seems to be any recurrence, they are given some more injections. Many patients go on this way with no inconvenience except that of repeated injections.

Those who can readily afford the time and expense I advise to be treated surgically.

Dr. Stanley Maxeiner: Hernias in children frequently disappear following the use of trusses only to reappear later in life when they engage in heavy lifting or athletics. It is my opinion that occasionally postoperative hernias are only the recurrence of a childhood hernia which has been brought about by loss of weight, attenuation of muscle and a loss of muscle tone which results in the reopening of a sac which has never been destroyed.

The United States government does not indorse hernia injections and as a result, this treatment has not been used in our experience at the Veterans Hospital.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of December 11, 1940

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, December 11, 1940. Dinner was served at 7 o'clock and the meeting was called to order at 8 p. m. by the president, Dr. James Johnson.

There were fifty-four members and one visitor present.

The following officers were elected for the year 1941:

President—Dr. John Armstrong, Saint Paul
Vice President—Dr. Martin Nordland, Minneapolis
Secretary-Treasurer—Dr. E. V. Kenefick, Saint Paul

The secretary read a letter from Mrs. C. B. Wright expressing appreciation for the memorial to Dr. Wright which was read at the November meeting of the Academy.

Dr. Martin Nordland read the following memorial to Dr. Herbert Jones.

HERBERT W. JONES
1873-1940

Dr. Herbert W. Jones, a member of the Minnesota Academy of Medicine since 1911, died suddenly on July 9, 1940. He was a native of Wisconsin, born in Berlin, October 13, 1873, and there he received his early education. His medical course was completed at the University of Minnesota in 1902. His early association with Dr. W. A. Jones prompted him to go to Vienna in 1906 to study neurosurgery. Because of his continued interest in this subject, he developed unusual skill in brain surgery. His thesis read before the Academy in February, 1911, was concerned with the problem of brain surgery.

He was married to Margaret Daniels of Minneapolis in 1909. To them were born three sons, Herbert, Jr., Roderick and David. In spite of his large practice, he found time for companionship with his family and devoted much time to the raising of his sons, one of whom, Herbert, Jr., had the good fortune to practice with his father for a short time. Dr. Jones was very fond of boys and through his generosity several young men were assisted in getting a higher education.

Dr. Jones, a member of the M Club, continued his interest in the University after his graduation. He was very active in the Medical Alumni, for which organization he had served as secretary and president. He belonged to the Nu Sigma Nu medical fraternity and was an honorary member of the American Neurological Association. Besides the Minnesota Academy of Medicine, he was a member of the American Medical Association and the state and county societies. Dr. Jones was a member of the Asbury and Northwestern staffs and was president of the latter in 1936 and 1937.

Farming was his hobby and in the latter years he gave much serious attention to the management of the farms which he owned. Death came to him while he was returning from his farm at Cottage Grove, Minnesota.

Dr. Jones was an earnest, serious worker and a true friend. He enjoyed the meetings of the Academy and attended with regularity.

The scientific program followed.

PANCREATIC LITHIASIS

Albert M. Snell, M.D.
Rochester, Minnesota

Abstract

Eighteen cases of pancreatic lithiasis have been encountered at the Mayo Clinic during the last three years. Roentgenologic evidence of stone was present in each instance; in six cases the diagnosis was confirmed by surgical exploration and in two others the diagnosis was substantiated by necropsy. Review of the literature reveals an increasing number of cases of pancreatic lithiasis and there is much to suggest that the condition is not nearly so uncommon as was formerly believed.

The usual effect of pancreatic stone is destruction of the pancreas; the acinar tissue is destroyed first by a process of fibrous atrophy and fatty replacement. The islands of Langerhans usually are preserved until late in the course of the disease. The principal clinical symptoms are pain of a colicky nature; motor disturbances of gastro-intestinal function, steatorrhea and complicating disorders including fulminant infections, such as tuberculosis, endocarditis, and pylephlebitis, are fairly common.

When the pancreas is more or less completely destroyed, fatty metamorphosis of the liver may ensue. It is suggested that roentgenograms of the pancreatic area should be made of patients who present (1) obscure attacks of abdominal pain or gastro-intestinal "storms" of uncertain origin, (2) diarrhea with fatty stools, (3) unexplained enlargement of the liver with or without ascites, (4) diabetes, particularly if it be associated with such abdominal symptoms as colic or diarrhea, or (5) jaundice of indeterminate origin. The roentgenologic picture is itself characteristic and in most instances should suffice to make the diagnosis.

Treatment of pancreatic stones is necessarily a surgical problem. It is of interest to note that neither pancreatitis, peritonitis nor pancreatic fistula appear to be particularly common during the postoperative state. Early diagnosis should lead to successful treatment in a substantial number of cases.

Discussion

Dr. H. B. Zimmermann, Saint Paul: I would like to ask Dr. Snell if any of the patients have been relieved by removal of the stone.

Dr. Snell: This question may be answered in the affirmative. When it has been possible to remove stones from the pancreatic duct, relief has been obtained. A few successful surgical procedures have been reported at the clinic and elsewhere. Most of the patients are seen very late in the course of the disease and are beyond the reach of surgical treatment.

Dr. C. N. Hensel, Saint Paul: Is any special roentgenologic technic used for locating the stones?

Dr. Snell: I think only what would be advised for locating stones of the kidneys and ureters. It is unfortunate that I did not bring some of the original films of these stones to demonstrate. The shadows are opaque and often can be seen throughout the course of the pancreatic duct. There is diagonal distribution of shadows at about the level of the first lumbar vertebra which can be seen easily on either side of the vertebral column. They are usually demonstrated in oblique views of this region.

SOLITARY(?) MYELOMA OF THE SPINE WITH CORD INVOLVEMENT

Case Report

Gordon R. Kamman, M.D.
Saint Paul

Mrs. M. N. a widow, aged sixty-nine, was seen in consultation at St. Joseph's Hospital with Dr. W. H. Von der Weyer on October 9, 1940.

The family and past medical histories were irrelevant to the present complaint. Mrs. M. N. stated that aside from "a little arthritis of the spine" in the fall of 1939 she was well until May 18, 1940. On that date while entering a street car she fell landing on the left hip. The conductor helped her up and she boarded the car. There were no immediate symptoms other than generalized aches and pains. Two days following the fall she consulted her family physician who found that the left 9th rib had been fractured. There also was a hematoma of the left hip. The left chest was fixed with tape which the patient wore for about two weeks. During that time her progress was satisfactory and there was no trouble in her legs. About one week after the accident she began to have pain in the *right side* at about the same level at which the rib had been injured on the left. At first this pain was localized but in about two weeks it had assumed girdle characteristics involving the left side as well as the right. The pain was severely aggravated by coughing, sneezing or straining. The patient stated "I have prayed constantly that I never would have to cough." About three months after the accident Mrs. N's legs began to feel numb. This was about August 10, 1940. The numbness started between the knees and the ankles and in one or two weeks had extended above the knees and up to the level of the girdle pains previously described. Shortly after the numbness began the legs grew weak and this weakness increased. For nine days prior to my first examination on October 9, 1940, the patient had been unable to walk. There was no disturbance in sphincter functions and no symptoms referable to the upper extremities or cranial nerves.

The neurological findings were confined to the lower extremities. There was a flaccid paraplegia with preservation of the knee and ankle jerks. There was an extensor plantar response on the left and a positive Chaddock on the right. There was bilateral abortive clonus. The sensory examination revealed the absence of pain sense from the 9th dorsal dermatome down. Temperature sense was intact. Touch sense was absent on the right from the knee down and the lower half of the left leg. Vibration and passive motion were impaired in both ankles.

The diagnosis at that time was incomplete trans-

verse lesion of the spinal cord at the 9th dorsal segment (opposite seventh dorsal vertebra).

Radiographs made of the spine were negative except for marked hypertrophic arthritis involving the dorsal spine and old compression fractures of the bodies of the 12th dorsal and 1st lumbar vertebræ. There also was rather a sharp localized scoliosis of the upper dorsal spine toward the left side. There was no evidence of destruction of the pedicles or the laminæ of any part of the spine.

On October 11, a spinal tap was performed with the patient in the lateral recumbent position. The fluid was clear, slightly yellow and under 8 mm. mercury pressure. On strong juglar compression the pressure rose slowly to about 9 mm. and did not fall upon release of the juglar compression. Upon examination of the fluid one lymphocyte was found. The Wassermann reaction and colloidal gold curve were negative but the protein was elevated to 144 mm. per 100 c.c.

On October 16, 1940, the neurological examination showed the absense of both touch and pain sensation from the 7th dorsal dermatome down and there was paralysis of bladder and bowel functions. My notes made at that time read "This constant sensory level together with the subarachnoid block as demonstrated on the Queckenstedt test together with the elevated CSF protein leads to a diagnosis of rapidly increasing compression of the spinal cord at the seventh dorsal segment. Advise immediate exploration through laminectomy of the third, fourth and fifth dorsal vertebræ." The operation was performed on October 19 by Doctor Von der Weyer. As the neural arch of the fourth dorsal vertebra was exposed some granulation tissue came into view. The arches of the 3rd and 5th dorsal vertebræ were taken off and a mass about two inches in length was encountered. This mass was a dark mahogany color, had a smooth glistening surface and was irregularly shaped. It was entirely extradural. The mass was removed, bleeding controlled and the wound closed in the usual manner. Mrs. N. failed to rally from the operation and died six hours afterwards. Permission was requested for an autopsy but refused.

The pathologist's report submitted by Dr. Thomas J. Kenyon, pathologist at St. Joseph's Hospital, was as follows:

"*Gross.*—On sectioning the tumor it appeared to be composed of white rather friable material.

"*Microscopic.*—The tumor was composed of numerous distinct cells which appeared rather closely packed together. The outline of the cell can be sharply demarcated from the adjoining cell. The nuclei are pushed eccentrically and suggest a plasma type of cell. This picture is frequently seen in multiple myeloma. While there does not appear to be any obvious involvement of the bone with this specimen it is possible this tumor could have extended from the portion of the vertebræ lying more ventrally.

"*Diagnosis.*—Multiple myeloma.

"Later pieces of the bony laminæ removed at the operation were decalcified and numerous plasma cells are noted which are typical of multiple myeloma."

In this case we have no proof whatever that we were dealing with a solitary myeloma. The patient died before we knew the pathological nature of the lesion so radiographs of the skull and long bones were not made. However, it can be said that radiographs of the vertebral bodies as well as ribs and clavicles did not show any myelomatous involvement.

About twenty cases of solitary myeloma are reported in the literature. Some of these showed involvement of the femur, others of the clavicle, one of the mandible, and several of the vertebræ.

Solitary myelomas may be divided into two groups—

1. Those which started as a single lesion and subsequently became generalized.

2. Those in which the lesion remains solitary during the entire period of observation either until the death of the patient or at the time of the original report.

The question arises as to whether or not all solitary myelomata would eventually become multiple. I believe the answer is found in the fact that cases have been reported of solitary myelomata of four, nine and ten years' duration. The question occurs to me as to whether solitary myelomata of this nature and the classical multiple myelomata which are seen so much more frequently are the same pathological entity.

In our case no opportunity was had to determine the Bence-Jones protein in the urine. In the cases reported in literature this was found in practically all of the multiple myelomata and in a fairly high percentage of the solitary ones.

The only similar case found in the English and German literature was one reported from the Massachusetts General Hospital in the early part of this year. It was the case of a patient suffering from a paraplegia of fairly rapid onset. X-ray studies of the spine were negative but at the time of operation involvement of the 11th dorsal lamina was seen. This patient was still alive at the time of the report.

Discussion

Dr. A. W. Adson, Rochester: The case with myeloma reported by Dr. Kamman is unique as far as my limited experience is concerned, since it occurred late in life, grew unusually rapidly and was but a single lesion. I recall two patients on whom I performed laminectomy to relieve cord compression. One was a male who presented a high dorsal lesion with bony destruction of the pedicle. The neurologic symptoms were those of radiculitis and beginning cord compression. Numerous roentgenograms of the spine, skull, long bones and pelvis failed to reveal other lesions. The laminectomy uncovered a friable, reddish, pulpy mass which proved to be a myeloma on pathologic examination. The patient was advised to have massive doses of x-ray therapy. This advice he accepted and went to the Memorial Hospital of New York for his treatment where he received tremendous doses of high voltage therapy. In spite of this, he succumbed to his disease in about two years. Although he had but one obvious lesion at the time of his laminectomy, others soon made their appearance. Therefore, the most that can be hoped for from a laminectomy and partial removal of an intraspinal myeloma is very slight temporary relief. About the same amount of relief is to be expected as from a laminectomy and partial removal of a metastatic lesion of the spine, a result which scarcely justifies the surgical hazard.

The second patient presented the usual symptoms of an intraspinal tumor. Roentgen rays of the local area of the spine failed to reveal bony destruction. After the pathologic diagnosis was made on the tumor tissue, additional examination of the bones revealed other lesions. Again the outcome was the same, a gradual decline with a cachectic death.

Dr. John F. Noble, Saint Paul: I have had no personal experience with the so-called solitary myelomas. Many of these tumors thought to be solitary will, if followed over a long period of time, prove eventually to be multiple. The generalized character and the destructive nature of the disease was emphasized to me by a case observed at autopsy by one of the men in the department of pathology at the University of

Minnesota. In his zeal to do a complete study of a case of multiple myelomata at autopsy, he took specimens of bone from the spine. The gross appearance of the bone was normal and x-rays of the spine just before death had showed no evidence of tumor involvement. After decalcification, the specimens of bone from the spine in microscopic section showed typical myelomatous infiltration. If, then, bone which is normal in appearance on x-ray and gross examination, can be proved to contain myelomatous tumor cells, I believe we should accept solitary myelomas only after very careful clinical study and autopsy examination.

Dr. Kamman (in closing): I felt, like Dr. Adson, that multiple myeloma was more likely to be found in young people; but, in looking over Peet's case reports, I noticed there were several patients in the middle age group. Doctor Noble's remarks concerning myelomatous involvements being discovered only after decalcification of the vertebral bodies were very interesting. It goes to show that one can have serious and fatal involvement of bones without roentgenographic evidence early in the course of the disease. In my patient we did not have time for x-ray studies of the skull and long bones because she died six hours after operation.

I still feel, of the cases of solitary myeloma seen, many will become multiple if the patients live long enough. However, there must be such a thing as solitary myeloma. Whether the pathologic changes are the same, I cannot say; but there seems to be abundant clinical evidence to show a solitary myeloma can go on indefinitely without becoming multiple.

The meeting adjourned.

E. V. Kenefick, M.D., *Secretary.*

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

Manual of Clinical Chemistry. Miriam Reiner, M.Sc., Assistant Chemist to Mount Sinai Hospital, New York. Introduction by Harry Sobotka, Ph.D., Chemist to Mount Sinai Hospital, New York. 296 pages. Illus. Price, $3.00, flexible binding. New York: Interscience Publishers, Inc., 1941.

Manual of Physical Diagnosis With Special Consideration of the Heart and Lungs. Maurice Lewison, M.D., Professor of Physical Diagnosis, University of Illinois College of Medicine; Consulting Physician, Cook County Hospital; Attending Physician, Mount Sinai Hospital, Chicago; Formerly Attending Physician and Chief of Tuberculosis Staff, Cook County Hospital; and Ellis B. Freilich, M.D., Associate Professor of Medicine, Cook County Graduate School of Medicine; Attending Physician and Chief of Tuberculosis Staff, Cook County Hospital; Consultant to the Chicago Municipal Tuberculosis Sanitarium; Attending Physician, University Hospital; Associate Attending Physician, Mount Sinai Hospital, Chicago; In Collaboration with George C. Coe, M.D., Instructor of Medicine, University of Illinois College of Medicine; Associate Physician Cook Co. Hospital; Chinical Assistant, Mount Sinai Hospital, Chicago. 317 pages. Illus. Price, $3.00 cloth. Chicago: Year Book Publishers, Inc., 1941.

Born That Way. Earl R. Carlson, M.D. 174 pages. Price, $1.75, cloth. New York: John Day Co., 1941.

Physiology in Modern Medicine—Macleod's. Ninth Edition. Edited by Philip Bard, Professor of Physiology, Johns Hopkins University School of Medicine, with collaborators. 1256 pages. Illus. Price, $10,000, cloth. St. Louis: C. V. Mosby Co., 1941.

An Introduction to Dermatology. Fourth Edition. Richard L. Sutton, M.D., Sc.D., LL.D., F.R.S. (Edin). Emeritus Professor of Dermatology, University of Kansas School of Medicine; and Richard L. Sutton, Jr., A.M., M.D., L.R.C.P. (Edin). Assistant Professor of Dermatology, University of Kansas School of Medicine. 904 pages. Illus. Price, $9.00, cloth. St. Louis: C. V. Mosby Co., 1941.

Electrocardiography in Practice. Ashton Graybiel, M.D. Instructor in Medicine, Courses for Graduates, Harvard Medical School; Research Associate, Fatigue Laboratory, Harvard University; Assistant in Medicine, Massachusetts General Hospital; and Paul D. White, M.D. Lecturer in Medicine, Harvard Medical School; Physician, Massachusetts General Hospital in charge of the Cardiac Clinics and Laboratory. 319 pages. Illus. Price, $6.00, cloth. Philadelphia: W. B. Saunders Co., 1941.

THE POISON TRAIL. William F. Boos, M.D. Cloth, 380 pages. Price $3.00. Boston and New York: Hale, Cushman and Flint, 1939.

The author, now seventy, has had an interesting career in medicine and toxicology. He received his A.B. at Harvard in 1894, Ph.D. in Chemistry, Heidelberg, in 1896 and M.D., Harvard, in 1901. Early becoming interested in medicolegal investigations he has served as medical expert and toxicologist for the government since 1908 and has held other important positions in the same connection. He has made many contributions to scientific literature on chemical subjects and subjects relating to internal medicine, occupational poisoning and public health.

This is the author's first book, well and interestingly written for lay consumption. It is practically an autobiography, covering his own experiences with various poison cases and giving much information of value regarding the different poison agents involved. Written almost like a novel it is easily read and highly informative. It especially emphasizes the necessity of keen, systematic and competent investigation in all medico-legal autopsies where poisoning is a possibility.

Equally illuminating are the author's comments on canned foods. In the last fifteen years he states that he has investigated countless charges against the food canning companies, yet in all that time he failed to encounter a single authentic case of food poisoning of any kind traced to commercially canned food and he has yet to hear of one, although the contents of millions of cans are consumed daily throughout the United States.

A book like this should go far to dissipate the ignorance and superstition which has lingered so long in the public mind over the various matters with which it deals.

Gilbert Cottam.

GRADUATE MEDICAL EDUCATION. Report of the Commission on Graduate Medical Education. 304 pages. Chicago: University of Chicago Press, 1940.

The Commission on Graduate Medical Education was organized for the purpose of formulating the educational problems and principles involved in the medical training of graduates and the adequate development of specialists, whereby they might be kept abreast of new developments in diagnosis, treatment and prevention.

A detailed consideration is given to the training of interns. Suggestions are offered in regard to a desirable length of service, the requirements of a satisfactory service and the various responsibilities of the intern, the hospital authorities and the medical staff of the institution. The general purpose should be a preparation for general practice with this goal in the minds of all those who may participate in the various features of this process. When feasible, or possible, opportunity should be offered for a progression into special fields.

In certain hospitals with adequate teaching facilities and with the opportunities for wider experience, residencies may be established whereby selected students and interns are rendered broader fields for personal development along special lines of work, at the same time utilizing the talents of the applicant for the promotion of better teaching among the interns.

Graduate education among the men in practice is stressed and the plans in various states discussed, pointing out similar and varying features which have proved advantageous. This method of teaching is intended to aid not only those on general practice particularly, but also specialists. It must always be the primary goal to make any course offered attractive in form and variety, topical in its appeal, but also convenient, concise and cognizant of economic expediencies.

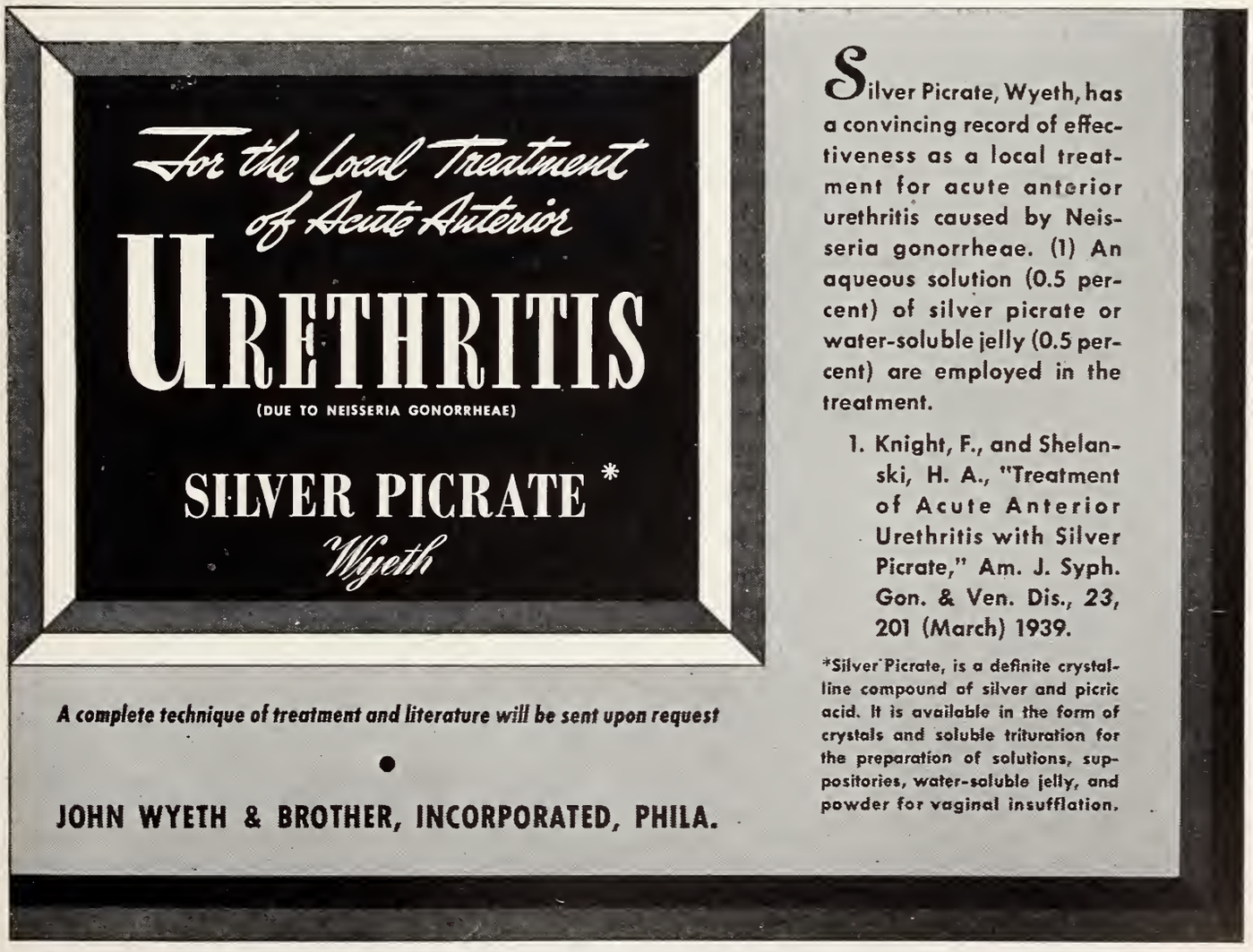
Specialty boards must look to proper allocation of specialists so as to avoid an over-supply in certain areas, as already appears the trend in middle-sized cities. Certification will no doubt become more difficult, but it must be realized that the certification of men already doing special work has been necessarily facilitated, lest retroactive measures prove unjust to the applicant. The boards have already done excellent work and no doubt will continue to do so in withholding recognition from those who are inadequately fitted by training or personality.

Some consideration is given to a discussion of graduate teaching in England and parallels drawn with methods in this country.

The method of graduate instruction as pioneered by the University is quite fully discussed and its attractive features stressed.

For anyone interested in graduate medical education the book supplies much valuable and instructive material, compiled by a commission which has the weight of authority, good judgment and experience.

FRANK J. HIRSCHBOECK, M.D.



CANCER IN CHILDHOOD; AND A DISCUSSION OF CERTAIN BENIGN TUMORS. Edited by Harold W. Dargeon, M.D., F.A.A.P., Attending Pediatrician, Memorial Hospital for Cancer and Allied Diseases, New York. 114 pages. 42 Illus. 9 Tables. Price, $2.70. St. Louis: The C. V. Mosby Company, 1940.

The reader of this symposium will ever be alert to become constantly aware of the prevalence of cancer and allied diseases in the infant and the child. The author has well emphasized childhood cancer as one of the important children's diseases.

The author has acknowledged the generous grant received from the estate of the late Elizabeth Edwards, making possible the free distribution of this book to a number of libraries. It is the recommendation of the reviewer that this volume be added to the educational list in the Cancer Movement.

LILLIAN L. NYE, M.D.

CLINICAL DIABETES MELLITUS AND HYPERINSULINISM. Russell M. Wilder, M.D. 459 pages. Illus. Price $6.00. Philadelphia: W. B. Saunders Company, 1940.

The book, Clinical Diabetes Mellitus and Hyperinsulinism by Dr. Russell M. Wilder, is indeed a fine addition to this subject. This book is written in a very readable and understandable style. It should be very welcome to the rank and file of physicians who are called upon to treat diabetes but do not necessarily limit their practice to it.

The development of each chapter in the book is logical. The author begins with a clear delineation of the primary factors that come to play in the maintenance of the normal blood sugar level. In the preface the author states "Purposely omitted from this book is extensive consideration of the theory of carbohydrate metabolism, the physiology of experimental diabetes, and the pathology of diabetes." This premise makes this volume fully a clinician's monograph.

In the exhaustive second chapter diabetes mellitus is defined and the methods for its diagnosis established. The reader has carefully called to his attention certain of the otherwise confusing non-diabetic melliturias. A lucid description and differentiation is made with regard to renal glycosuria (the so-called normoglycemic dextrosuria), alimentary hyperglycemia and diabetes innocens all of which terms have at times provoked much confusion.

Dietary management of the diabetic, diabetic cookery, insulin therapy and the requirements for effective therapy, all receive exhaustive consideration.

In Chapters 10 and 11 the author discusses acidosis and coma in diabetes, as well as infections complicating diabetes. Both of these chapters are highly recommended to the reader because of their orthodox and well tried therapeutic programs that they preach. One would do well to refer over and over to their well chosen words of admonition and advice. Full consideration is given in succeeding chapters to complications of every manner that the diabetic like any non-diabetic may fall heir to.

The last several chapters in the monograph are given over to that interesting subject of hyperinsulinsim. The author is in a unique position to write authoritatively on this important subject because of his extensive and pioneering experience. Adequate discussion is given to the methods necessary to make this diagnosis. Medical and surgical management is presented.

The author on page 19 states, "Those who adhere to the unitarian conception of diabetes, as I do, define this disease as an abnormality of metabolism created by insufficiency of the insular activity of the pancreas. In diabetes the homeostasis of the blood sugar level is permanently disturbed." Dr. Wilder gives a great deal of force and vigor to his unitarian stand. The entire volume reads well and logically. The author has made full use of many footnotes which may prove a bit disturbing to the continuity by some readers because of their newness in medical writings, but certainly serve a most useful purpose. They are much like "stage whispers," fortifying and accentuating the main thought. Many bits of interesting information were placed in these foot notes. Their use was indeed most refreshing. In the foot note on page 68 the author makes an almost prayer-like point when he says, "Another dramatic illustration of the far-reaching influence of the discovery of insulin is provided by the rescuing from premature certain diabetic death of the Nobel Prize Winner, Dr. George Minot. Dr. Minot later was able to contribute importantly to the discovery of the effective treatment of pernicious anemia, and thereby prolonged other valuable lives to add to the sum of values of communal life."

This volume by Dr. Wilder is a highly clinical and exhaustive treatment of the subject of diabetes and hyperinsulinism which will be found extremely acceptable.

SIMON G. SAX, M.D.

AS I REMEMBER HIM. Hans Zinnser. Price $3.50. Boston: Little, Brown and Company, 1940.

We venture to predict that this delightful volume will be recorded among the best of the year.

Purporting to be the life and thoughts of another, it is in fact the autobiography of a physician. The many entertaining anecdotes make it easy reading, but there is interspersed throughout the book evidence of deep thought.

After reading the book one wishes he could have known the author.

C. B. D.

DON'T EAT BREAD. Allen Klein, Ph.G. 116 pages. Price, cloth, $1.00. Emmaus, Pa.: Rodale Press, 1939.

The Greeks had a word for it, "diatribe," a wearing away of time. Intended primarily for reading by the layman, this little volume by specific statement as well as implication charges the cereal grains wheat, rye and corn with direct or contributory causation of an astonishing number of the human ailments and infirmities to be found listed in any standard medical dictionary between the extremes of ā a ā disease and Z.Z.'Z." The author modestly states: "This book offers irrefutable proof, based on medical authority, that *wheat and some of the other grain cereals* are the causes of undernutrition, obesity, and a host of present-day ills." The major premise remains unsupported even after reading the text.

M. McC. FISCHER, M.D.

MINNESOTA MEDICINE

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GOUT—A FORGOTTEN DISEASE*

E. L. TUOHY, B.A., M.D., F.A.C.P.
Duluth, Minnesota

MANY years ago a querulous man hobbled into my examining room berating fate, doctors and pharmaceuticals because his "rheumatism" was killing him and no relief was forthcoming. He was obese and conditionally alcoholic. That, defined, means his truculence was only enhanced by periods of sobriety. His lament as to medicine arose from the circumstance that five years previously a doctor in Georgia had given him some medicine that "cured" him overnight. All medicine taken since that time suffered equally with him in exhibiting superb futility.

To look at him casually, one would say "rheumatoid or infectious arthritis." Yet, while he later suffered some permanent osteo-arthritic changes, the joints most painful and swollen retained no essential disability in remissions. Casting about for an answer to the identity of this wholesome and overnight Georgian remedy, it suddenly dawned upon me "this man must have gout." And so began a long association with a man who taught me a great deal about gout. On many occassions, I confess, he must have passed fully out of my mind, for I know I join with most Minnesota physicians in frequently overlooking gout. Indeed, "out of mind is out of heart."

It is for this reason that I title my discussion "The Forgotten Disease." Somehow there has grown up a tradition that gout is a disease of Merrie Old England, and that it occurs but rarely in America. There are no present available statistics for gout with us. It is very poorly cross-indexed in our clinics and hospitals; it likely never figures as a primary cause of death; I have never seen it mentioned in our autopsy protocols, even where gout was diagnosed and known to be present in life. For instance, my gouty friend never got over his gout, but it didn't cause his death—that came with hypertensive, myocardial failure. In the course of his stormy life it became harder and harder to terminate his immediate attacks. Once W. A. O'Brien was a visitor. This man came in with a grotesquely enlarged and swollen forearm to the elbow. The hand was puffy, purple red and only moderately painful. To "O.B.," I said, "Take one look and make a diagnosis." He did so and replied, "Lymphangitis." Then I asked him why the man had no fever, and why this came on over night—all too rapidly for any obvious infection. In short, he was quite abashed by my statement that this grotesque arm was gout. I had seen it before. Under colchicum and cinchophen, the arm was normal appearing in thirty-six hours. I have never seen such an extremity in anyone else.

Specialism has carried medical service to the point that, where available, patients are prone to bring their somatic distresses directly to some doctor covering that anatomical assignment. It is good that well trained specialists do not forget constitution and general physical background. An obese butcher, aged 58, is a case in point. He had been a heavy beer drinker and a lover of plenty of fat meat. He selected the fattest cuts and ate the fattest portions. Late in October, 1939, he had complained of ankle soreness and a swelling at the base of the right great toe. A physician advised him to take cinchophen. On November 21, 1939, he consulted Ophthalmologist Frank Knapp on account of a very striking condition suddenly obtaining the previous evening in his

*From the Department of Medicine, The Duluth Clinic. Read before the Minnesota Society of Internal Medicine, Rochester, Minnesota, November 11, 1940.

right eye. There developed an edema, swelling, redness and sense of heat in the right eye. There was no definite pain but a constant sense of itching. Doctor Knapp recognized the oddity of this development and sent him for a general checkup. He volunteered at once the history of beer drinking and fondness for fat, and directed my attention to the pains and distresses in his feet, all betokening gout. We found the uric acid of his blood to be 5 mgm. per cent. This was repeated several times over a period of two weeks and never dropped to our normal* during the period of observation. Suffice it to state that through giving the patient colchicum, modifying his diet and eliminating beer, his eyes were restored to normal in three days.

Thereupon Dr. Frank Knapp went back into the literature and informed me that he did not find much currently, but he found the following which I have excerpted from a report made fifty-six years ago by the famous Jonathan Hutchinson.[5] This is most illuminating.

"There is a condition which, for want of a better name, I have for long been in the habit of recognizing as Hot Eye. It is one of the many curious phenomena which attend quiet gout. I use the term quiet gout as distinct from acutely paroxysmal gout. In families liable to gout, one person who becomes the subject of acute attacks of podagra—what is known as "unequivocal gout"—there are often half a dozen who are the subjects of minor symptoms which denote a similar tendency. . . . Amongst the frequent occurrences which denote its presence are repeated short attacks of congestion of the eye. Usually one only is affected, but sometimes both. The conjunctiva becomes red, and the eyeball feels hot, and pricks, as if sand were in it. The attack may come on within half an hour of the meal which has disagreed, and it may last a few hours, or a day or two.

"A further practical note I must ask leave to make. It is to the effect that many cases of irritable, hyperesthetic and easily tired eyes in young persons are in association with inherited gout. I feel sure that in some of these cases we are in the present day in danger of pushing the recommendation of spectacles to an excess.

". . . Such patients will often state that they are very susceptible to the influence of beer and wine, and that malt liquor and some wines almost always cause indigestion, and make the urine muddy. These dietetic disturbances, to which as a test of gout attention was, I think, first claimed by Sir James Paget, are very important and valuable."

*The uric acid tests have been done in our laboratory with whole blood according to Benedict's modification of the Folin technic with an average normal 3 mgm. per cent. Those using blood serum with blood collected under oil report an average normal of 6 mgm. per cent.

Wood,[9] a South African, as late as 1936 referred back to Hutchinson's article and reported a series where ocular manifestations of gout again appeared exemplifying the outstanding feature of "hot eye." Wood found some association of iritis and some of his cases had gone on to destruction of the eye. Those interested should consult his article.

A certain Slovanian servant girl came under my observation at about the time (1939) that Lockie[6] published his article pointing out the relationship of gout to metabolism of fat. This girl weighed 210 pounds when only seventeen years of age. She oozed through any confining wardrobe. To make matters worse, her considerable surface area gave greater opportunities for expansion to a psoriasis that sort of negatived any incentive to dieting and attaining a svelte silhouette. Nevertheless, there came a day when the family said, "Something must be done about it." She began a period of 800 calorie intake and within eight days had severe gouty arthritis. Immediately, as the ordinary food intake is restricted, an obese subject is automatically exposed to a high fat, or even a ketogenic diet. This may also help to explain exacerbations of gout after operations or injuries where the patient eats much less than usual. I have seen a similar "hot eye" in a very obese young man soon after he went on a restricted diet. I could not, however, establish any hyperuricemia.

According to Hench,[2] not more than 3 per cent of gout occurs in women. This figure seems low. Hill[3] gives his "English statistics" reporting approximately twenty-four per cent in women. Hench and Vanzant collected their cases chiefly in the arthritic section of the Mayo Clinic. The English have had a long historical and literary, not to say political, contact with gout. It is possible that they may attribute over much to gout; and we in America are over-zealous in attempting to attribute much arthritis to focal infection. Confusion is most likely to occur in differentiating rheumatoid arthritis (infectious?) from gout. Indeed, it is possible that both conditions may override.

A woman librarian, forty years old, illustrates the possible diagnostic difficulties. She has the meticulous and exact personality seen traditionally in those women sensing the gradual invasion of an arthritis too obvious to ignore and too silent to disable. She noticed trouble in one

finger six or seven years previously. This joint spindling remained remarkably localized. Before I first saw her she had been given intravenously Wetherby-Clawson vaccine. She was very desi-

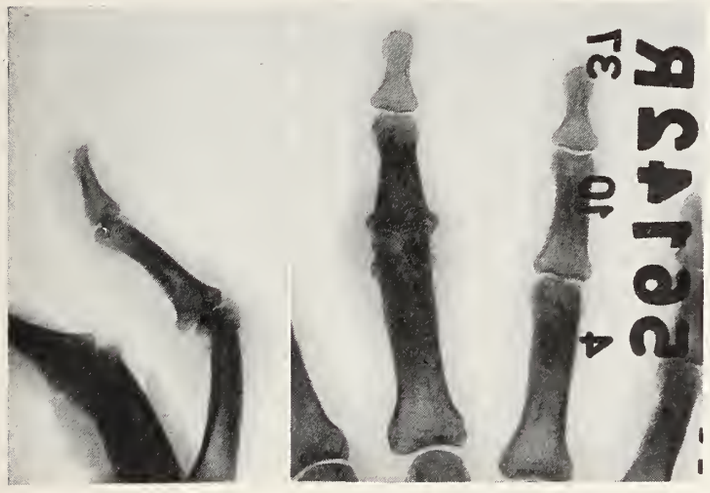


Fig. 1. The woman, aged forty, a librarian, discussed in the text. The punched-out areas are obvious.

rous of continuing it. She never showed any definite reaction one way or another. It was the same with various other methods of treatment tried over a period of three years. She would show an occasional flare-up in this one finger, or a few other finger joints would swell casually. Not until her ankles joined in the progression did I resolve to try out the injections of gold salt. This treatment was carried out meticulously at an arthritic clinic connected with one of our large universities where she spent the past summer doing graduate work. Nothing special happened. She returned to Duluth in the early fall. As long as she rested, she was better; when tired, or using her joint unduly, she was worse.

Suddenly she had a flare-up with especial swelling of the ankles. Then she drew my attention to the very obvious bilateral olecranon bursitis.* Despite normal blood levels (3 mgm. per cent) of uric acid, she has up to date responded to colchicine therapy vastly better than to any previous treatment. It is my understanding that present roentgen opinion does not hold that typical "punched-out areas" are necessarily due to gout. It is also mentioned in various articles in connection with rheumatoid arthritis. Comroe's[1] book gives an outline of roentgen differentiation of gout and rheumatoid arthritis. The reproductions he gives lend confusion, but

*Said to occur three times as often in gout as in any other condition.

that is apt to follow when attempting to reproduce finer roentgen film detail. Figure 1 is a reproduction from this patient. Figure 2 is introduced for comparison from a supposedly "prov-



Fig. 2. This is presented for comparison with Figure 1. The two seem very similar. She consulted me in July, 1940, simply for a check on the uric acid of the blood, while vacationing here. Her story was similar to my patient's—"had been studied at various clinics and universities in Chicago," where, she stated, "they finally decided I had gout although women aren't supposed to have it, and the treatment helped me at once." I found uric acid values to be 3.2 mgm. per cent.

en" instance of gout in a woman, aged fifty-eight.

As to the question of uric acid levels, Hench has reported that he has seen unquestionable gout with uric acid levels as low as 2 mgm. per cent. Smyth[7] reports that he has seen hyperuricemia in members of the families of gouty patients without any special symptoms. I have not seen marked drops in uric acid levels at all proportional to the clinical benefits after treatment with colchicine. In general, therefore, the definite relationship of gout to uric acid still offers many moot problems. While glycosuria occurs in diabetes, no one is likely to confuse either glycosuria or hyperglycemia with the cause of the disease.

As to whether gout is a metabolic disease or not, Talbott and Coombs[8] have studied the problem and their conclusions are noteworthy. Their article should be consulted not alone for this feature, but also for an excellent statement of the

method, the advantages and the rationale of the treatment of gout wih crystalline colchicine, both during acute exacerbations and in quiet remissions.

It remains, therefore, either to affirm or challenge the therapeutic response of 0.5 to 1 mgm. of colchicine given at two or three hour intervals up to tolerance (digestive irritation and diarrhea) as a diagnostic procedure. Colchicum is said to be specific for gout only. Loskie's high fat, low protein and low carbohydrate diet is based on his experience where nine out of ten individuals in remission were given an attack by this diet; and they were promptly taken out of the attack by the administration of colchicine. Therefore, it would appear that high protein diets, as formerly so much held, are less responsible than the "high rich foods" so often consumed with liberal amounts of alcohol by gourmets. The final conclusion regarding diet by Talbott and Coombs agrees with this contention.

Tophi in my experience have been rare, especially in mild or borderline cases. In any case, the literature mentions only a 60 per cent incidence. I recall a man who drew my attention to aural tophi. At the time had no gouty symptoms; however, within a few weeks he developed, after a trivial blow on the lower leg, a very tender, swollen area. It cleared at once with colchicine. I am sure that had I not noticed his ears, gout would never have entered my mind. Later on he developed occasional twinges, but for the most part has very little trouble.

At intervals a chart comes to me and going back over it I notice that I treated obvious gouty attacks in patients who now appear with the infirmities of age. Certain afflictions once established, such, for example, as diabetes, tend to dominate a patient's life. This does not appear to be the situation with most of the gout I have encountered. Hench's well-known "twenty points" (1938) have repeatedly helped to "tune me in on the right wave length" in order to suspect and interpret gout. His citations of sudden development, association with slight trauma, exposure to cold, postoperative reactions, and nocturnal alarms after seasonal, familial or goodfellowship gatherings—all these items so well catalogued by Hench should be occasionally reviewed, both to further our own survival and advance our medical effectiveness.

A 50-year-old, obese executive illustrates this association. Among those who have golfed with him, his proficiency at the nineteenth hole has been the subject of comment and perhaps some emulation. The next day after such an exhibition I saw him with what he called "blood poison" on the dorsum of the foot, occasioned by "the overtight lacing of his shoe." The uric acid of his blood was 5.2 mgm. per cent.

I have made it a point to swear such mild victims of gout to a certain amount of secrecy concerning their disability. In the first place, I have told them that the indications were only suggestive and that it might take two or three decades to establish whether their malady was an accomplishment in good living, or retribution for misapplied efforts. So far as I have been able to judge, there are none so poor that they may not have a gouty inheritance, a love of fatty rich food and a yearning for the cup that cheers. In any case, rich or poor, no gouty subjects get as much sympathy as ribbing—therefore, within reason, they should not broadcast their affliction.

Summary and Conclusions

This conversational account of gout is the disease—chiefly in the atypical form—as I have seen it. It is intentionally drafted to avoid monographic pretentions. I am assuming that where we suspect gout, a voluminous literature from which to refresh ourselves with details is at hand. Gout is practically as enigmatic as when Sydenham had it and described it (see historical review of Hormell[9]). While we may quibble over whether to catalogue it as a metabolic process or not, we cannot deny its familial tendency and constitutional background. Uric acid is deposited in the tissues in certain areas; nevertheless, rich, fatty diets (Lockie) and alcohol (beer and ale) precipitate attacks. These come in individuals with a certain background or gouty diathesis. However, Hench codified a list of many other trigger factors. The disease does not kill and is therefore lost, for the most part, to statistical enumerations. The x-ray offers little in the way of positive selective criteria. Colchicine as a therapeutic test in acute attacks is more determinative than either hyperuricemia, the presence of aural tophi, or bursitic accumulations. Gout is a disease ideally suited to sharpen the physician's clinical acumen and judgment. Without these faculties it will be frequently overlooked.

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PRACTICAL POINTS IN FEMALE SEX HORMONE THERAPY*

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THE subject of endocrinology, particularly as related to the female sex organs, presents a fascinating field for study and speculation. The vast experimental work, which is constantly being carried out on laboratory animals, is rapidly correlating the somewhat confusing, isolated findings into a semblance of order, so that we soon will have a perfectly plain rationale of treatment for the hormonal deficiencies.

In my opinion, the greatest weakness in this field of medicine is in diagnosis. This will not be corrected until there are simple, easy laboratory procedures developed, which will allow the practitioner to assay the amounts of the various hormones and their relation to the normal, which may be present in the individual patient. It is true that these tests can be carried out in experimental laboratories now, but they are not yet generally available to the profession. When this condition is corrected, treatment by the practitioner will be conducted on a more rational basis.

The whole subject of female endocrinology is a little confusing at times, particularly in view of the apparent contradictory advice given to use different hormones for the same condition. As an example, both gonadotropic hormone and progesterone are advised in the treatment of functional uterine bleeding in young women. This is not contradictory advice, but only different physiological methods of attaining the same result, namely, the converting of a hyperplastic cystic endometrium into a secretory endometrium which will result in a normal complete menstruation.

The subject is so vast, and new facts are coming to light so rapidly, that it is not possible in a paper of this kind to even attempt to cover the field or review the literature. It is thought that a brief, simplified résumé of the present status of endocrinology, as related to the female sex organs, might be of value at this time, together with the author's experience with some of these hormones.

Let us briefly review the normal physiology as developed in laboratory animals. It is generally believed that the pituitary gland is the so-called master gland of the body, and that most of the other glands of internal secretion are somewhat dependent upon it for stimulation. In this paper we will consider only the anterior lobe of the pituitary and its functions. It elaborates four main hormones, thyrotropic, parathyrotropic, adrenotropic, and gonadotropic. We will limit our discussion to the gonadotropic hormones, as these regulate ovarian function.

The function of the ovary is controlled by two distinct hormones elaborated by the anterior pituitary, the follicle stimulating, and the corpus luteum stimulating. The follicle in turn forms the estrogenic hormone, which causes regeneration of the endometrium and its growth into the so-called proliferative state of development, after which the follicle ruptures and ovulation takes place. The endometrium is greatly thickened and the glands become elongated. However, this hormone alone does not cause full development of the endometrium to the point where implantation of the fertilized ovum can occur. The effect of progesterone, which is elaborated from the corpus luteum, is needed to bring the endometrium to the premenstrual or secretory phase, preparing it for nidation of the fertilized ovum. If the ovum is not fertilized it dies, the corpus

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luteum degenerates, progesterone is withdrawn, and the endometrium breaks down and is expelled from the uterus with bleeding.

In derangements of the endocrine balance there may be various combinations. The follicle may not receive enough stimulation from the pituitary to become mature and rupture. If it fails to rupture, it continues its effects on the endometrium, and cystic degeneration occurs in the endometrium, functional bleeding takes place, and because it fails to ovulate no corpus luteum develops. Therefore, no progesterone is formed to carry the endometrium through to its pregravid stage. Breaks may occur anywhere along the line, and the hormones are used to attempt to repair these breaks.

We have for practical purposes four different hormones which react well in experimental animals and some of which are of value chinically. These four are: (1) follicle stimulating, (2) corpus luteum stimulating, (3) estrogenic, from the follicle, (4) progesterone, from the corpus luteum, the first two coming from the pituitary and the last two from the ovary. Estrin and progesterone do not stimulate the ovary at all; they only stimulate the endometrium. They are purely substitutive in character and not gonadotropic.

The follicle stimulating gonadotropic hormone is obtained from the pituitary gland of animals, and it has a very slight luteinizing effect also. While this preparation is effective when used on laboratory animals, the results in clinical work have been disappointing. The preparations are unstable and soon lose their potency[2]. Perhaps when a more potent preparation is available the results will improve.

The corpus luteum stimulating hormone is obtained from the urine of pregnant women. It also stimulates follicle development to a slight degree. This is called chorionic gonadotropic hormone because of the association with chorionic villi of pregnancy, where it is elaborated. This is available commercially as Antuitrin "S," Follutein, A. P. L., Antophysin, et cetera. It is an anterior pituitary-like substance and differs from that obtained from the pituitary gland. This hormone also, while it works well in animal experimentation, has a rather limited field of usefulness in practice, and results have varied widely in the hands of different workers.

Theoretically, it should be used in functional bleedings, particularly near puberty, in an attempt to stimulate corpus luteum formation, so that sufficient progesterone will be formed to carry the hyperplastic endometrium on to the premenstrual phase. According to Mazer and Goldstein, endometrial cystosis and hyperplasia always occur together. Abnormal bleeding occurs in advanced stages of hyperplasia when localized areas of necrosis and dilated veins are present in the superficial layers of the endrometrium. They believe that the hyperplasia is caused by a too long continued stimulation by the un-antagonized follicle or estrogenic hormone, rather than by an excessive amount, and that the absence of progesterone is the factor which permits the abnormal continuation of the action of the estrogenic hormone. Emil Novak[5] says that the most frequent variety of functional bleeding is that due to failure of rupture of the follicle with ovulation, and functional persistance of the unruptured follicle for a variable time.

These anterior pituitary-like substances have never been shown to have caused ovulation in the human. In my experience, the results obtained have been very disappointing in most cases, and have not been any better than those obtained by other means before the advent of these substances.

Equine gonadotropic chorionic hormone is obtained from the blood serum of pregnant mares. It is different from the two previous substances discussed; it contains both follicle stimulating and corpus luteum stimulating factors. It is the only hormone, with which I am familiar, which will cause maturation of the ovum and rupture of the follicle in the human.

The indication for its use is failure of ovulation, which is probably fairly common, and it must be remembered that the corpus luteum cannot develop unless ovulation occurs. Therefore, it should be useful in sterility due to failure of ovulation, and also in functional bleeding due to prolonged action of estrin on the endometrium, which in turn is caused by failure of ovulation and the failure of the corpus luteum to develop and control the action of estrin.

In my experience, this material is far superior to the other gonadotropic hormones. I have had two successes in sterility with this substance. They were both one-child sterilities of four and

five years, respectively. The tubes were patent and the menses fairly regular. The other hormones had been used intensively with no result. The material, Gonadogen, was given in one large dose of sixty units on the twelfth day of the cycle and pregnancy promptly ensued. One patient was delivered last month and the other is in her third month of a normal pregnancy. No endometrial biopsies were made in these cases, but they were probably instances of failure of ovulation. I have had fair success in a small series of cases of functional bleeding. I have discarded the other gonadotropic hormones almost entirely in favor of this material. The only drawback is the expense.

We now come to the two ovarian hormones, the follicle, or estrogenic, and the corpus luteum, or progesterone. They have no effect on the ovary itself; they are used clinically to make up for ovarian deficiency. Estrogen controls endometrial development, a deficiency prevents normal regeneration after menstruation, this hypoplasia may result in scanty menstruation or in amenorrhea. It also tends to counteract or inhibit the effect of the anterior pituitary hormone. It is probably the unapposed action of the anterior pituitary hormone, which causes the unpleasant symptoms of the menopause, and so the administration of estrogen gives symptomatic relief. It is most valuable for menopausal symptoms; it is also good in the treatment of gonorrheal vaginitis in children, and in senile vaginitis. It produces its effect in both instances by causing the vaginal mucosa to become thickened and cornified, approaching the adult type of mucosa found during sexual maturity, thus making it more resistant to infection and irritation.

Estrogenic hormone is probably harmful in functional bleeding due to hyperplasia and cystic degeneration. The lack of progesterone is the trouble here. It is valueless in amenorrhea unless there is a true endometrial hypoplasia present. An endometrial biopsy will determine this. Estrin combats uterine hypoplasia and renders the uterus receptive to whatever ovarian function remains, or may be induced by treatment with thyroid or gonadotropic substances, and so may be of value in sterility due to uterine hypoplasia.

There has been some mention in the literature of the danger of encouraging the development of carcinoma by long continued treatment with this hormone. Zondek[8] gave enormous doses up to 1,200,000 rat units to women over long periods, and is of the opinion that there is no danger of carcinoma. He produced great cystic hyperplasia and erosions of the cervix, but no carcinoma. Neither follicles nor corpus luteum developed, and no gonadotropic hormone was released from the pituitary. This also occurs during pregnancy. The large amounts of estrogen present during pregnancy is what prevents new follicles from developing, due to its inhibitory action on the anterior pituitary. Geist and Salmon[1] are also convinced of the freedom from danger of carcinoma.

At the present time there is great confusion in the matter of units of dosage. The international unit is a weight unit, and equals one-tenth of a microgram of estrone. There are several estrogens of different chemical composition and purity. It is thought by most workers that the estrogens should be measured by their effects on spayed rats rather than by weight, and they believe that the rat unit should be used. One rat unit of estrone equals five international units of estrone, but this proportion does not hold good in the case of estradiol and other estrogens of different chemical compositions.

It is estimated that the human female needs 500 Rat Units (2,500 International Units) as purely maintenance dosage, but where there has been a total lack of estrogen for some time, as in the castrate or menopausal woman, the minimal amount of estrogen which will cause the atrophic endometrium to proliferate is 50,000 Rat Units a month, or 1,750 daily for one month. Mazer and Israel[4] advise 10,000 Rat Units (50,000 International Units) every fourth day with gradual reduction of dosage. Often smaller doses will give symptomatic relief at the menopause.

Progesterone is used in the treatment of functional bleeding; it carries the hyperplastic endometrium over into the menstrual stage. It is purely substitutive and does not correct the ovarian dysfunction, which is responsible. It may well be combined with the A. P. L. chorionic gonadotropic hormone, or that from mares' serum. Before progesterone can produce its effect, the endometrium must have first been under the influence of estrogen.

Progesterone also tends to prevent uterine contractions induced by estrin or pituitrin, while estrin makes the uterus more susceptible to contractions induced by pituitrin. For this reason progesterone is valuable in early threatened abortion. I have had good results in this condition. It has been advocated in the treatment of pernicious vomiting and dysmenorrhea. I cannot report any specific cures in these conditions.

Before closing I would like to mention endometrial biopsies. There is no question but that this method is the scientific way to study the different phases of endometrial development and its response to hormone therapy. However, it needs a trained technician to prepare the slides and the procedure is not wholly without danger. Randall[7] has shown that the findings are not always conclusive, and that functional bleeding may occur in almost any phase of the endometrium. This has also been my experience. It probably has its greatest value in studies of sterility in an attempt to determine whether or not the patient ovulates. In a small experience with endometrial biopsies, I have not been greatly impressed with their practical value.

In conclusion: (1) In the author's experience from a clinical standpoint, the gonadotropic hormones obtained from the pituitary glands of animals and from the urine of pregnant women have been of very little value. (2) The gonadotropic hormones obtained from the urine of pregnant mares show great promise. (3) The estrogenic hormone is the most constant and dependable of all the hormones. (4) Endometrial biopsies have not enough practical value to justify the additional trouble, expense and slight danger involved in their use.

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DIETHYLSTILBOESTROL: A SYNTHETIC ESTROGENIC HORMONE

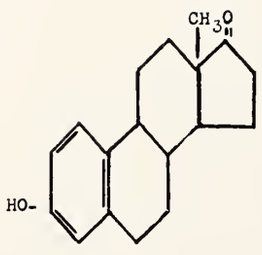
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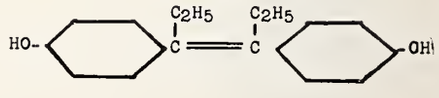
THE natural estrogenic hormones, estrone and estradiol, lose 95 per cent of their activity when administered orally. Estriol, also a natural occurring hormone, is more active orally than the other two, but at best is not a very effective substance. These estrogenic hormones together with the other sex hormones possess a pentenophenanthrene nucleus in their chemical structure.

In 1938 Dodds and his co-workers synthesized a substance that had the formula ($C_{18}H_{12}O_2$) 4:4 Dihydroxy Alpha: Beta Diethylstilbin, an entirely different chemical structure from the natural occurring hormone. This substance was found to be very active when administered orally and had the additional advantage of cheapness in manufacture.

Experimental studies on animals and humans showed that it was capable of producing all the biological effects of natural estrogens. It was active in producing proliferative changes in the endometrium; it caused withdrawal bleeding and



ESTRONE



DIETHYLSTILBOESTROL

would reduce the excretion of gonadotropic hormones after castration.

Both in the human and in animal experimentation stilboestrol was found to have some very

definite side effects. In rats it produced epistaxis, vaginal and intestinal bleeding. It also produced fatty degeneration of the liver and enlargement of the adrenal gland. In doses of 0.5 to 1 mg. it produced death in mice, and in doses of 5 mg. daily for twenty-five to fifty days it caused disturbances in the myelogenic tissue in dogs. Although the toxic effects appeared to be very definite it must be remembered that the doses were proportionately larger than the amount of the substance used clinically.

TABLE I

Diagnosis	No. of Cases	Therapeutic Results			Treatment with Stilboestrol
		Excellent	Good	Poor*	
Menopause Spontaneous	20	10	3	7	0.1 mg. tid up to 2.0 mg. daily
Menopause X-Ray	1			1	1 mg. daily, 40 days
Menopause Surgical	4	3		1	1 mg. daily 20 – 40 days
Amenorrhea	2	1		1	3 mg. daily 30 days 1 mg. daily 20 days
Acromegaly	2		1	?	3 – 8 mg. daily Total 519 mg. in 5 months
Mastopathy	2	1	1		0.3 mg. daily 7 days
Diabetes Insipidus	1			1	1 mg. 2 days
Migraine	2	1	1		1 mg. daily 10 days
Total	34	16	6	12	

*Of the twelve patients included under poor results seven suffered with reactions and did not receive sufficient medication.

Considerable literature is now available reporting clinical studies. Several very severe reactions have been noted, but no fatal cases are on record. The toxic effects appear to be quite temporary. The percentage of unfavorable reactions vary greatly among the different investigators, the figures running from 3 to 60 per cent.

Most of the toxic reactions appear as nausea and vomiting, diarrhea, restlessness, skin eruptions, toxic psychosis, parethesias and thirst. Clinical studies have failed to show any definite evidence of renal, hepatic or myelogenic tissue changes. The reactions were often so slight that the administration of the hormone could be continued.

Stilboestrol has shown itself to be a very active estrogen when taken orally. It apparently is almost as active by mouth as it is by injection. It is fifteen to twenty times as active orally as estrone. However, it is only a fourth to a third as active intramuscularly as estradiol benzonate and much less active than the new partial synthetic estrogen ethinyl estradiol.

In all probability its oral activity depends on the inability of the liver to change or inactivate this substance in the manner in which the natural estrogens are altered. This inactivating mechanism in the liver is believed to be necessary to prevent a harmful accumulation of estrogens in the body. For that reason it is believed by some that the administration of an estrogen resistant to the liver may be deleterious.

This report is based on observations made in thirty-four cases in which stilboestrol was administered. In all cases careful urine, hemoglobin and leukocyte count determinations were made at intervals. No other laboratory tests were made, except that in some instances urinary sex hormone excretion studies were determined, but these values will not be included in this report.

The amount of diethylstilboestrol given varied greatly in the individual cases. In the menopause group, no patient received more than 2 mg. daily,

whereas the majority of these patients received one mg. daily. In several instances satisfactory results were achieved with 0.3 mg. a day.

TABLE II. REACTIONS TO MEDICATION

Group	Type of Reaction	No. of Cases	Percentage
I*	Severe reactions	7	20.6
II	Mild reactions	3	8.9
III	Reaction to oral, but not to hypodermic	1	2.9

*The reactions under Group I required cessation of medication. In cases under Groups II and III medication was continued.

Two young females with amenorrhea were observed. In one case 3 mg. daily for thirty days produced a rhythmic menstrual flow that lasted for four periods; the other patient received 1 mg. daily for twenty days with no effect. Diethylstilboestrol was given to two individuals with acromegaly with the hope that large amounts of estrogenic hormone would inhibit the pituitary activity. One patient received at various intervals 3 to 8 mg. a day over a period of five months, taking a total of 519 mg. The other patient with acromegaly was not followed long enough to make any observation that would be of value. Two cases of mastopathy in young girls who had most of their trouble around the menstrual period were given 0.1 of a mg. three times a day for seven days preceding the onset of the period. The single patient with diabetes insipidus after taking 1 mg. a day for two days developed a very unfavorable reaction and was forced to stop the medication. The two individuals with migraine that occurred around the menstrual period were given 1 mg. daily for ten days before the onset of the period.

It appears that in some cases there is a very definite relationship between the size of the dose and the development of disagreeable reactions, although several individuals developed unfavorable side effects on 0.3 mg. daily. It was noticed frequently that on raising the dose above 1 mg. a day the patient became nauseated, and on reducing the dose to one mg. or less a day the nausea disappeared. The majority of the patients, however, could take apparently any size of dose without any disturbance. In my group five patients had nausea, and in two of these it was severe enough to cause vomiting. Two patients had a peculiar full sensation in the head, and two others complained of lassitude. Three patients complained of tightness in the throat that caused a feeling of suffocation. This type of reaction, as far as I know, has not previously been reported.

The therapeutic results in the menopausal group as a whole appeared to be excellent, and those able to take a sufficient amount of the hormone had an improvement comparable to those who received an adequate amount of the natural estrogen by hypodermic injection. Of the twenty-five cases of menopause, sixteen were either completely or almost completely relieved of their symptoms. Of the nine cases grouped under the heading "poor results," four were unable to take a sufficient amount of the hormone and five did not improve even with a sufficient dosage.

Of the two cases of amenorrhea, one result was good with 3 mg. daily for thirty days; the other result was not good, but this patient received only 1 mg. daily for twenty days. This was probably due to an insufficient amount of the hormone. The middle-aged woman with acromegaly who received 519 mg. of stilboestrol in a period of five months had some very definite effects. The headaches were lessened, the voice was improved and the soft tissue and particularly the width of the nose was definitely improved. This result might be due to reducing the activity of the pituitary gland or to the feminizing influence of the hormone. The result was not sufficiently satisfactory to eliminate the necessity of further therapy of another type such as x-ray. The second patient with acromegaly was not followed long enough to form a definite opinion.

The two patients grouped under the heading of migraine had their attacks around the menstrual period and both were benefited considerably by the medication. In the group of spontaneous menopause there were also several who had migraine and who received benefit from this therapy.

A great deal has been written both for and against the clinical use of diethylstilboestrol. Its advantage, of course, lies in the fact that it is active orally, and, in my experience, dose for dose, it is as active orally as the natural hormones are by injection. It had, in my group, the disadvantage of producing in at least 20 per cent of the cases reactions so disagreeable to the pa-

tient that they would prefer to have their symptoms rather than medication. There is no good evidence that in the doses used clinically there occurred any permanent injury to the tissues of the body. Inasmuch as relatively small doses are often effective in relieving symptoms, and that the size of the dose is often responsible for the production of unfavorable by-effects, one should start with doses of not more than 0.1 mg. three times a day, gradually increasing this dose until either the desired effect is obtained or until the patient becomes uncomfortable from the medication.

It seems that where the cost of medication is important, and in those individuals who do not tolerate hypodermic injections, diethylstilboestrol offers a very valuable addition to our hormone therapy.

NOTE: Since the presentation of this paper before the Minnesota Society of Internal Medicine, in June, 1940, at Duluth, Minnesota, the number of cases treated with this preparation has been in the neighborhood of one hundred with essentially the same results. The diethylstilboestrol used in this study was furnished through the kindness of the Winthrop Chemical Company, Inc., and the Abbott Laboratories. No difference was noted between the preparations furnished by these two companies.

THE DIAGNOSIS OF PANCREATITIS*

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THE diagnosis of pancreatitis and, to a lesser extent, the diagnosis of malignant lesions of the pancreas have been a surgical rather than a medical problem. This is not a matter for wonder when one considers the situtation of the pancreas deep in the abdomen, its inaccessibility to palpation, the ability of diseases of the pancreas to mimic disease of other organs in the upper part of the abdomen, and the lack of accurate laboratory procedures for the diagnosis of pancreatic disease. However, this situation is undergoing a change, and the diagnosis of pancreatic disease pre-operatively is being made with increasing frequency. The change may be attributed to the development of laboratory methods of diagnosis and the increased awareness of pancreatic disease that the use of such tests has brought about.

Acute Pancreatitis

Interest in acute pancreatitis has been directed almost entirely to the more severe grades of the disease, such as pancreatic necrosis. The mild forms of acute pancreatitis have been ignored until the last few years. Pancreatic necrosis is a rare disease and important largely because of its high mortality. The mild degrees of pancreatitis, on the other hand, occur frequently and are important because of their effect on the postoperative convalescence, because they may terminate in pancreatic necrosis and because they may become chronic and produce persistent disturbances of pancreatic function. Both the mild and severe degrees of pancreatitis may be diagnosed pre-operatively if the condition is suspected clinically, if the clinical data are carefully weighed and if simple laboratory aids are utilized. Some of the problems involved in the diagnosis and the clinical and laboratory data useful in reaching a pre-operative diagnosis of acute pancreatitis are illustrated by the following case.

Case 1.—A woman, aged thirty-eight years, registered at the Mayo Clinic May 18, 1937. She stated that recurrent attacks of epigastric colic, severe enough to require morphine for relief, had begun in 1929. These attacks at first had occurred once every six months but recently they had occurred as often as every two months. A very severe attack associated with nausea, vomiting, chills, fever and jaundice had taken place in March, 1937. Minor attacks had occurred frequently since that time; a severe attack had begun four days prior to her registration at the Mayo Clinic.

Examination disclosed a slight icteric tint to the skin and sclera and slight tenderness and rigidity in the right upper quadrant of the abdomen. Urinalysis did not disclose any abnormality. The value for the hemoglobin was 13.8 gm. per 100 c.c. of blood. The leukocyte count was 15,700 per cubic millimeter of blood and 93.5 per cent of the leukocytes were neutrophils. The concentration of bilirubin in the serum was 1.6 mg. per 100 c.c. and the van den Bergh reaction was direct. The activity of lipase in the serum, expressed in terms of cubic centimeters of twentieth-

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read at the meeting of the Southern Minnesota Medical Association, Red Wing, Minnesota, September 23, 1940.

normal solution of sodium hydroxide, was 5.3. The value for the serum amylase was 1,500 units. The diagnosis was chronic cholecystitis with stones, acute pancreatitis and possibly a stone in the common bile duct. Exploratory laparotomy, which was performed on May 21, 1937, confirmed the clinical diagnosis of cholecystitis, gallstones and acute pancreatitis. Cholecystectomy was performed for subacute cholecystitis with cholelithiasis. The pancreatitis was graded 2, on the basis of 1 to 4, by the surgeon. Exploratory choledochostomy did not disclose stones and the scoop could be passed through the lower end of the common bile duct and into the duodenum without encountering resistance.

Acute pancreatitis or some complication of cholecystic disease such as pancreatitis may be suspected when an attack of biliary pain is prolonged, when the attack recurs frequently, if not daily and is associated with persisting tenderness in the right upper quadrant of the abdomen and in the epigastrium. Pancreatitis may also be suspected when the pain is not relieved by the administration of morphine. Pancreatitis is almost certain to be present when the pain and tenderness spread to or involve the left side of the epigastrium and especially so if the pain extends to and tenderness develops in the left subcapsular region. In case 1 it was the frequently repeated attacks of pain which suggested the possibility of acute pancreatitis and led to the determination of the concentrations of amylase and lipase in the blood serum. The presence of a stone in the common bile duct was suggested by the history of jaundice which in this case must have been due either to cholangitis or an associated hepatitis.

The diagnosis of acute pancreatitis may be established with great accuracy by the determination of values for lipase and amylase in the serum.[4,5,6] These values rise above the normal of 1.5 c.c. of twentieth-normal solution of sodium hydroxide for lipase in the serum and 320 units for amylase in the serum within a few hours after the onset of the acute episode. The maximal increase is reached within twelve to twenty-four hours and the values then decline. The value for the amylase usually reaches normal within three to four days and that for lipase usually becomes normal in seven to fourteen days. If positive findings are to be expected with any great regularity, values must be determined early in the course of the disease. The concentration of lipase in the serum has so far been accurate in pointing to the presence or absence of active pancreatic inflammation in 99 per cent of cases and the concentration of amylase has been an accurate indication of the condition of the pancreas in 87 per cent of cases in which it has been possible to determine the status of the pancreas in the light of both clinical data and the description of the pancreas as given by the surgeon.[1] The values for amylase and lipase in the serum will be elevated in the more severe degrees of acute pancreatitis (pancreatic necrosis) so long as functioning pancreatic tissue remains.

Disturbances of carbohydrate metabolism occur in cases of acute pancreatitis but are usually transitory. Glycosuria has been reported in from 5 to 20 per cent of cases.[2,8,9,10] Hyperglycemia has been reported in from 50 to 100 per cent of cases[3,7,10] but because this condition also occurs in association with other acute diseases of the upper part of the abdomen and with coronary thrombosis, a concentration of less than 175 mg. of sugar per 100 c.c. of blood should be interpreted with a great deal of caution. If pre-existing diabetes can be excluded, glycosuria and hyperglycemia should point definitely to inflammatory disease of the pancreas if found during attacks of pain in the upper part of the abdomen. Tests for tolerance for dextrose may sometimes need to be performed in order to demonstrate the milder degrees of dysfunction of the islands of Langerhans which occur as a result of acute pancreatic inflammation.

Disturbances of the external secretion of the pancreas sometimes persist after disturbances of internal secretion have disappeared. They may be detected by study of the duodenal contents after stimulation with either secretin or mecholyl (acetyl-beta-methylcholine chloride). These methods of study will be considered subsequently.

Chronic Pancreatitis

Chronic pancreatitis to most physicians has usually meant the combination of steatorrhea and diabetes mellitus but these manifestations usually occur when the pancreatitis is severe. In cases in which the disease is mild it must be recognized by manifestations that are less marked than steatorrhea and diabetes mellitus. In its early stages chronic pancreatitis is manifested by repeated attacks of epigastric pain and tenderness, by disturbance of the motility of the stomach and intestine, and by jaundice produced by

pressure of the swollen head of the pancreas on the common bile duct. In cases in which the pancreatitis is severe, diabetes mellitus, diarrhea (either with or without steatorrhea), pancreatic calcification, fatty metamorphosis of the liver, hepatic decompensation with ascites may develop and loss of weight and even emaciation may occur. Chronic pancreatitis may or may not be associated with disease of the biliary tract. Chronic pancreatitis secondary to disease of the biliary tract may be suspected when disturbance of pancreatic function occurs during the course of cholecystic disease and whenever repeated attacks of colic occur following cholecystectomy.

Case 2.—A woman, aged forty-five years, registered at the Mayo Clinic July 16, 1934. In 1917 appendectomy and cholecystostomy had been performed for attacks of epigastric pain typical of biliary colic. In 1918 cholecystectomy had been necessary for relief of pain. In 1920, epigastric distress and pain, which usually had been induced by fat and fried foods, again had been noticed. The pain had been mild until eight months prior to her registration. During the eight months, the pain had become more severe and the patient had had five attacks of epigastric colic severe enough to require hypodermic injections of morphine for relief. The stools had been acholic during the attacks. The results of physical examination were essentially negative. Roentgenograms of the spinal column and stomach did not disclose any abnormality. The bromsulfalein test of hepatic function did not disclose any retention of dye. The concentration of bilirubin in the serum was 1.0 mg. per 100 c.c. and the van den Berg reaction was indirect. The activity of lipase in the serum in terms of twentieth-normal solution of sodium hydroxide was 1.7 c.c.

The diagnosis was not clear-cut; however, it was thought that cholangitis or a stone in the common bile duct was the most probable cause of the symptoms. The diagnosis of pancreatitis was considered. On July 27, 1934, exploratory laparotomy was carried out. The common bile duct was found to be 2 cm. in diameter but its walls were not thickened and were normal in color. The duct was opened and obstruction was met with in the region of the sphincter of Oddi and in the region of the pancreatic portion of the duct. Scoops were passed through the ampulla into the duodenum with difficulty. The pancreas itself was enlarged and nodular, and severe pancreatitis was present. A T tube was inserted in the common bile duct and left in place for three months. On August 19, 1934, cholangiography revealed the constriction of the common bile duct at its point of entrance into the duodenum. Ninety per cent relief of symptoms was obtained.

The diagnosis of pancreatitis was not made pre-operatively in this case. Pancreatitis was suspected, however, with stone in the common bile duct and stone in the stump of the cystic duct because of the history of recurring colic after cholecystectomy. Clinical manifestations did not point clearly to pancreatic disease; the value for the serum lipase was slightly elevated but this finding was ignored because of the small degree of elevation and because the test was new at that time and its reliability had not been established.

Pancreatitis unassociated with disease of the gall bladder or bile ducts is illustrated by the following case.

Case 3.—A man, aged fifty-six years, registered at the clinic August 5, 1940. He had been perfectly well until April 1, 1940. Severe, almost constant, pain and severe tenderness had been present in the right upper quadrant of the abdomen almost constantly from April 1 to 10. The severity of the pain had decreased but distress had occurred almost daily. The distress had seemed to spread to the left upper quadrant of the abdomen and across the back at the level of the costovertebral angles. It had been intensified by meals, particularly by heavy meals eaten at noon or at night. Urinalysis had not revealed any abnormality. On May 1, the daily number of stools had increased from three to five. Defecation usually had occurred with marked urgency about fifteen minutes after meals. After defecation the patient had observed droplets of fat floating on the water in the toilet. Another severe attack of pain had occurred on July 1. At this time the pain had been situated in the left upper quadrant of the abdomen. The pain had lasted for several days and had been associated with marked soreness; it had been followed by polyuria, polydipsia and polyphagia. His weight had decreased from 145 pounds (65.8 kg.) to 112 pounds (50.8 kg.).

Physical examination at the clinic disclosed that the liver could be palpated about 8 cm. below the costal margin on inspiration. The reaction of the urine was acid and the specific gravity was 1.035. Glycosuria was present; the urine contained 6 per cent of sugar. Acetone and diacetic acid were not present in the urine. Examination of the blood revealed that the concentration of hemoglobin was 13.5 gm. per 100 c.c. The leukocyte count was 12,700 per cubic millimeter. The concentration of sugar in the blood was 265 mg. per 100 c.c. The results of routine serologic tests for syphilis were negative. Analysis of the gastric contents revealed that the values for the total acidity and the free hydrochloric acid were 34 and 20 respectively according to the method of Töpfer. Examination of the stools revealed an excess of oil or fat. Roentgenologic examination of the thorax, gall bladder, stomach, terminal portion of the ileum, and the colon did not disclose any abnormality.

The patient was admitted to the hospital on August 10. His temperature and pulse rate remained normal. Further study of the blood including mor-

phologic study of the erythrocytes, did not disclose any abnormality. The concentration of bilirubin in the serum was 1.3 mg. per 100 c.c. and the van den Bergh reaction was indirect. The bromosulfalein test for liver function revealed retention of dye, grade 1. The concentrations of amylase and lipase were 106 units and 0.1 c.c. of twentieth-normal solution of sodium hydroxide, respectively. Fat made up 60.4 per cent of the dried stools. Studies of the external pancreatic secretion after stimulation with secretin showed marked diminution in the secretion of fluid, carbonate and the enzymes, amylase, trypsin and lipase.

He was given a diet containing 346 gm. of carbohydrate, 105 gm. of protein and 54 gm. of fat, in order to control the diarrhea. Glycosuria persisted in spite of the administration of 6 units of protamine insulin and 10 to 24 units of regular insulin daily.

The diagnosis was chronic pancreatitis and a disturbance of the internal and external secretions of the pancreas (diabetes mellitus and steatorrhea). Exploratory laparotomy was performed August 23. The head of the pancreas was found to be two or three times its normal size and to be the site of brawny induration; the body and tail of the pancreas were cylindrical. The organ was approximately 3.5 cm. in diameter, and its length was normal. The gallbladder and common bile duct were distended; however, the wall of the gall bladder was normal in color. The gall bladder was incised but no stones were found. Cholecystostomy was performed and a tube was inserted into the gall bladder. The liver appeared to be in normal condition.

The diabetes improved markedly and at the time of the patient's dismissal from the hospital on September 10 he was taking only 6 units of protamine insulin daily and his diet contained 346 gm. of carbohydrate, 145 gm. of protein and 69 gm. of fat. Glycosuria was not present and the concentration of blood sugar was 125 mg. per 100 c.c. on August 30. He was returned to his home on September 13 and was instructed to increase the intake of fat if there was no further trouble with diarrhea.

In this case the gall bladder, stomach and colon were excluded roentgenologically as the site of the disease process. The site of the pain and tenderness in the left upper quadrant of the abdomen, as well as the development of steatorrhea following the first attack and diabetes mellitus following the second acute attack, pointed with certainty to the diagnosis of pancreatic disease. Various laboratory studies proved that disturbance of pancreatic function was widespread.

In cases of chronic pancreatitis, elevations in the concentrations of lipase and amylase in the serum may persist between attacks and long after major and minor attacks have ceased. The concentration of amylase rarely is increased for prolonged periods. In this case, five weeks had passed since the last really severe attack and the values for amylase and lipase in the serum had returned to normal. Disturbances of carbohydrate metabolism may not be so marked as in this case and sometimes may be detected only by a diabetic type of blood sugar curve following the administration of dextrose. A very significant point about the diabetes in this case was its absence in the early stages and its development in the later stages of the disease. Study of the external pancreatic secretion may alone demonstrate that pancreatic disease is the cause of the attacks of pain after the acute inflammation has ceased. The duodenal contents are quantitatively collected after stimulation with either purified secretin or mecholyl.[5,6] Secretin is administered in doses of 1 clinical unit per kilogram of body weight. Fifteen milligrams of mecholyl administered subcutaneously stimulates external pancreatic secretion satisfactorily. The duodenal contents are most accurately removed by continuous suction through the double-barreled gastroduodenal tube devised by Agren and Lagerlöf.[1] By means of one barrel of this tube the gastric contents can be aspirated and thus prevented from entering the duodenal cavity and confusing the results of analysis of the duodenal contents. A negative pressure of 16 inches (40.6 cm.) of water has been found satisfactory. The duodenal contents are measured in cubic centimeters and the concentration and total secretion of carbonate and of amylase, lipase and trypsin per unit of time are determined and compared with values obtained for normal individuals. The importance of measuring the volume of duodenal contents obtained and of determining the total secretion of enzymes (concentration per cubic centimeter multiplied by the number of cubic centimeters of duodenal content obtained per unit of time) as well as the concentration of enzymes is well illustrated by data obtained in a case of chronic pancreatitis and shown in Figures 1 and 2. The low concentration of trypsin cannot be interpreted to mean diminished secretion of trypsin, for the total secretion per unit of time shows that trypsin is being secreted in amounts above normal. In Case 3 all of the fractions of the external secretion of the pancreas were disturbed. In some cases, however, secretion of amylase alone may be disturbed and this probably represents the

mildest degree of pancreatic injury. The decrease in the volume of duodenal contents and in the carbonate content seem to occur in the ease in the pancreas. According to Thaysen, only when 35 to 40 per cent or more of ingested fat is lost as neutral fat does a form of steator-

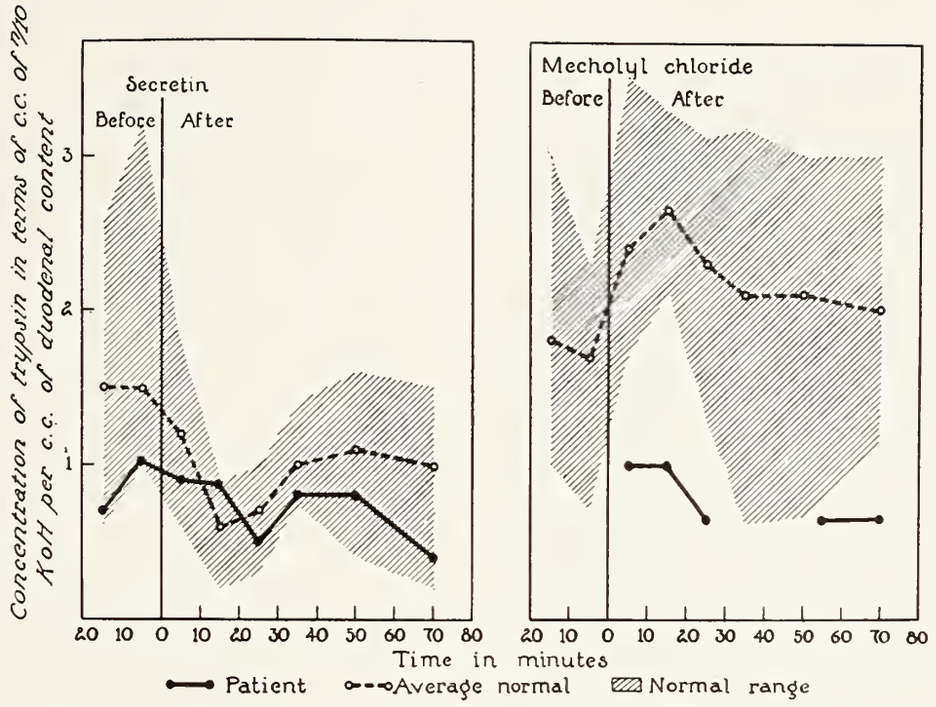


Fig. 1. The concentration of trypsin in the duodenal contents in a case of chronic pancreatitis is compared with the concentration in the duodenal contents of normal persons. The concentration of trypsin after stimulation with secretin in this case appears in the lower range of values found for normal persons but is definitely below this range after stimulation with mecholyl. The low concentrations do not mean abnormally low secretion but are due to the diluting effect of hypersecretion of fluid by the pancreas.

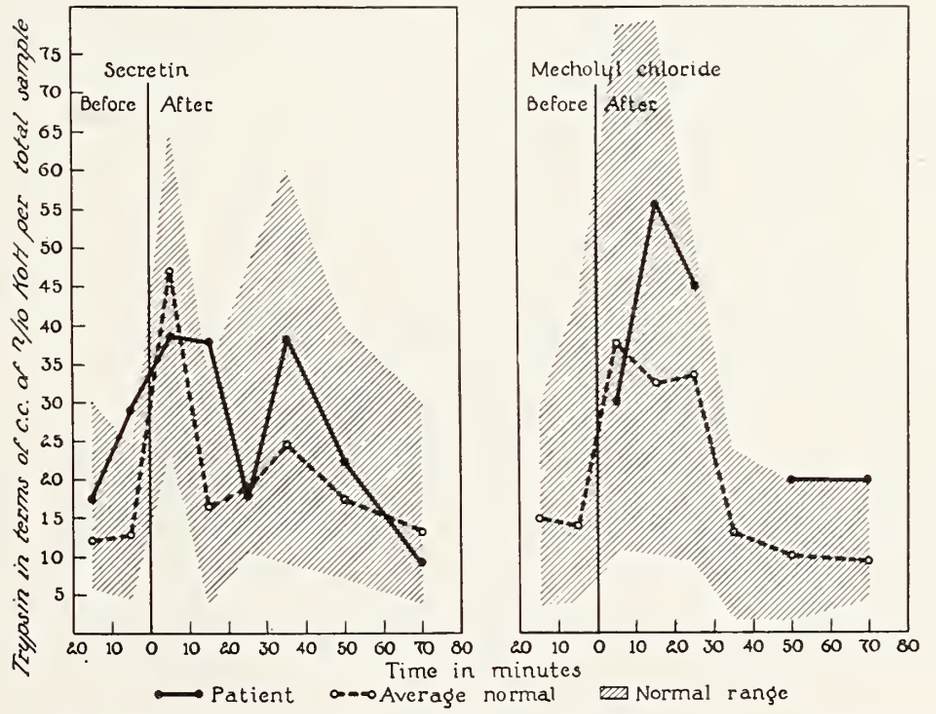


Fig. 2. The total secretion of trypsin in a case of chronic pancreatitis is compared with the total secretion of trypsin per unit of time by normal persons. A secretion of trypsin is seen after stimulation with both secretin and mecholyl in spite of the low concentrations of trypsin.

more extensive degrees of pancreatic disease.

Examination of the stools for food seldom furnishes information that will localize the disrhea diagnostic of pancreatic disease exist. According to the same author, the loss of more than 3 gm. of nitrogen in the stools per day

will probably distinguish the steatorrhea of pancreatitis from that due to diseases of absorption, such as sprue.

Among the mechanical effects of pancreatitis



Fig. 3. Roentgenogram showing extensive calcification of the head and body of the pancreas.

may be mentioned obstruction of the common bile duct with obstructive jaundice and disturbances of motility of the stomach and small and large intestines. The obstruction of the common bile duct may sometimes be demonstrated, as in Case 2, by cholangiography. Hypomotility of the gastro-intestinal tract may be marked. Retention of barium in the stomach for as long as twenty-four hours has been noted, as well as marked hypomotility of the bowel. The hypomotility at times may be due to actual ileus, which often is localized, and may lead to the erroneous diagnosis of intestinal obstruction. Pancreatic calcification (Fig. 3) may be demonstrated by special roentgenograms of the pancreas; when present it is bona fide evidence of previous or existing chronic pancreatitis. Fatty metamorphosis of the liver may be detected by the bromsulfalein test.

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EXTRAPLEURAL PNEUMOTHORAX*

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IN the treatment of pulmonary tuberculosis the extensive use of collapse therapy has been the major factor in improving the prognosis of patients entering the sanatorium with advanced and destructive lesions. Extrapleural pneumothorax has recently been added to the various surgical procedures used to collapse diseased lung in cases where intrapleural pneumothorax could not be induced. This procedure consists of stripping the lung, together with both layers of pleura, from the thoracic wall and mediastinum, thereby creating a space which is maintained by air injections. The purpose of this paper is to present the results of our small series of cases, to discuss the complications encountered, to describe the operative procedure and aftercare, and to give our impression of the value of this addition to collapse therapy.

Interest in this procedure was initiated by the report of the experiences at the Brompton Hospital for Diseases of the Chest, made by Belsey at

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the meeting of the American Association for Thoracic Surgery at Atlanta, Georgia, in 1938, and the interesting discussions following his paper. It was further stimulated by the reports of Overholt and Tubbs, and others which appeared in the literature shortly after this. We have been favorably impressed by Dr. Kinsella's results with the procedure of extrapleural pneumonolysis with the insertion of a paraffin pack. The use of paraffin, however, is limited to relatively small apical lesions. It seemed to us that a successful extrapleural pneumothorax might be the best way of arresting disease and closing cavities in cases in which thoracoplasty would be contraindicated due to extensive or recent involvement of the contralateral lung and in cases too toxic to consider risks for multiple stage thoracoplasty.

The first case of extrapleural pneumonolysis, with subsequent extrapleural pneumothorax, was performed at Nopeming in March 1939. Immediately thereafter, it was my privilege to spend a few days at Madison, Wisconsin, and at the Wisconsin State Sanatorium at Wales, where the results of a series of over fifty cases operated by Dr. Gale were impressive and influenced us in the selection of a small series of cases for this procedure. During the spring of 1939 we operated upon seven additional patients, thereafter waiting 10 months before adding any more cases to our series. In the two years since the first operation was performed at Nopeming Sanatorium, extrapleural pneumonolysis for the production of extrapleural pneumothorax has been done twenty-two times on twenty patients. In addition, the procedure was attempted but abandoned in three cases in which extreme inflammatory reaction made adequate stripping impossible. Bilateral pneumothorax was established in one case, later converted to bilateral extrapleural oleothorax and in one case a secondary pneumonolysis was performed to increase the collapse of the original pneumothorax. We have tried to make this series include as wide a variety of indications as possible from the standpoint of involvement of the lung, toxemia, and other considerations. During this time we have formed certain impressions which will be discussed later in this paper.

In our series of cases, three patients were operated under general inhalation anesthesia (cyclopropane); a combination of local supplemented by inhalation anesthesia was used in eight patients; eight patients were operated under local infiltration anesthesia exclusively; and in the last four consecutive cases intravenous anesthesia (pentothal sodium) was used together with intratracheal administration of oxygen. In one half of the group in which local anesthesia was used, it was necessary to supplement with inhalation anesthesia to completely control pain or cough occurring when the pleura was stripped from the mediastinal structures. Intravenous anesthesia with oxygen inhalation appeals to us as the most satisfactory method for this procedure.

Briefly, the operative procedure for the production of an extrapleural pneumothorax for an apical lesion is similar to that of an upper posterior stage thoracoplasty from the standpoint of surgical approach, duration of the procedure, and the postoperative reaction of the patient. The patient's position is the same as that used for an upper posterior thoracoplasty. The incision is similar but not as extensive in order to reach the costal bed. A segment of the third, fourth, or fifth rib is removed from the posterior angle laterally for a distance of about 10 cm., particular care being taken to strip the periosteum with as little damage as possible and to trim the resulting rib stumps so as to remove all of the rib from which the periosteum has been stripped. Through an incision in the periosteal bed, the extrapleural space is developed by separating the parietal pleura from the endothoracic fascia. The parietal pleura can be peeled along this plane without great difficulty as a rule. Most of the stripping is done with the finger or by careful dissection with a small gauze pledget on the end of a forceps. Occasionally areas of denser adherence may require sharp dissection, but by patient and careful freeing of the lung around these areas, they frequently can be peeled off with the gauze dissecter. The lung is usually freed posteriorly as far as the seventh rib, and anteriorly as far as the second rib, though the lysis may be more or less extensive depending, of course, upon the underlying pathology. It is extremely important that the apex be freed and that the stripping be carried down along the mediastinum below the arch of the aorta on the left and to the azygos vein on the right. Failure to free the apex completely may result in hung, slit-like cavities which remain patent. Bleeding encountered is usually

controlled by packing, though small arteries may be opened which require the use of silver neural clips for hemostasis. This occurs more frequently when the extrafascial plane is accidently entered during the dissection. It is not unusual to inadvertently lose the extrapleural plane and enter either into the extrafascial or into the intrapleural space.

I believe that it is always wise to free more of the lung than one feels is necessary to control the disease, as it is only too easy to allow the lung to re-expand. When sufficient lysis has been performed, the extrapleural space is washed out with normal saline and inspected for persistent bleeders, following which closure is made by continuous suture, using fine chromic gut to close the periosteal incision followed by an overlapping of the intercostal muscle from above and below the resected rib segment. The usual thoracoplasty closure completes the operation. In a few cases we filled the extrapleural space with normal saline solution before closure with the idea of making the first aspiration easier, but have since abandoned this procedure. With one exception, the average duration of the surgical procedure was 2 hours.

The morning following operation, a pneumothorax apparatus is brought to the patient's bedside and a needle is inserted into the extrapleural space via the first interspace, usually in the anterior axillary line. Manometric readings are taken, and enough air is injected to bring the pressures to approximately plus 10 cm. of water. On the second postoperative day the patient is fluoroscoped and brought to the operating room for aspiration and irrigation of the extrapleural space. The needle is inserted in the paravertebral region high in the thoracic cage. Thorough aspiration of the extrapleural space is accomplished without requiring much coöperation from the patient by using the Trendelenburg position and lateral tilt in order to have the fluid gravitate towards the apex where the needle has been inserted. I feel this is safer than attempting to tap the space near the lower border of the lysis where there is a possibility of lung puncture. The fluid, which is quite bloody, is aspirated and the space thoroughly irrigated with normal saline. If bleeding is found to be more than usual, it has been my habit to leave 200 or 300 c.c. of saline in the space, following which the pressures are again adjusted to a maximum positive of approximately 10 cm. of water. In the uncomplicated cases, we have aspirated approximately every other day until the space is dry. In this group the average number of aspirations required has been between three and four.

The reaction of the patient towards the surgical procedure is very similar to that of an upper posterior stage thoracoplasty. With the exception of three cases, the postoperative shock was estimated as slight to moderate. In the series of twenty-two operations, eleven intravenous infusions of saline were given; no transfusions were necessary; and oxygen was not required in any case. The blood pressure usually drops following operation for a matter of a few hours, rapidly returning towards normal. By the next morning the patient is usually able to eat breakfast and is quite comfortable. The duration of temperature and pulse elevation following operation in the uncomplicated cases averaged less than a week.

The success of the extrapleural pneumothorax is dependent more upon proper aftercare than on the surgical procedure itself. For this reason I believe the procedure will only be popular when carried out in a tuberculosis sanatorium or at least where the medical staff is thoroughly familiar with the treatment of complications of pneumothorax. I sincerely believe that the majority of the complications which we encountered would have been prevented if we had started out with the experience which we have since gained in handling this small number of cases. It is significant that six of the nine patients who had any complications whatsoever were in the first group of eight patients operated upon. It is to be realized that every extrapleural pneumothorax starts out complicated with a bloody effusion which later on becomes serous and which is an ideal culture for any contaminant organisms. For this reason vigorous treatment towards the removal of all bloody effusion with the object of obtaining a dry space as soon as possible must be pursued. Aspiration of the bloody effusion alone without thorough irrigation with saline until the fluid returns clear invites the development of postoperative empyema. For the same reason, extreme care should be taken to prevent any possible puncture of the underlying lung. When one follows aspiration of the effusion with thorough irrigation with normal saline, it is not

necessary to thoroughly dry the pleural space as small amounts of normal saline are quickly absorbed in the extrapleural space, leaving a dry pneumothorax. The importance of the saline irrigation has not to my knowledge been stressed in the articles written on this subject. In fact, the postoperative care of the collapsed lung has been passed over rather lightly by most of the writers. Possibly this is due to the fact that the articles have been written by the surgeons who have been overly impressed by the value of their particular part in the procedure, in other words the extrapleural pneumonolysis, and have not realized that the success or failure of the extrapleural pneumothorax has often been due to the judgement and hard work of the staff man in establishing the actual collapse.

In the beginning we tried to follow the advice of the writers regarding pressures. Many of them advocated rapid conversion of the pneumothorax to a high positive pressure type, using pressures of from plus 30 to plus 50 cm. of water. In an early group of patients we tried this method and ran into difficulties. We have since held our pressures down to a maximum of about 10 cm. during the first few weeks of the collapse therapy, later on in some cases increasing the pressures to a maximum of plus 30 cm. of water. We have found that the use of higher pressures is unnecessary, especially if one starts out with a pneumonolysis which has been more than adequate for the disease involved. With this margin to work with, one can allow the lung to gradually re-expand under daily fluoroscopic control during the first few weeks until one considers that the collapse is proper, only then increasing the pressures if necessary. This method is accompanied by practically no complications. If it is impossible to hold the amount of collapse desired, I am of the opinion that conversion to oleothorax is indicated, as this appeals to me as being a more logical procedure than subjecting the collapse to wide variations in pressure, and thereby inviting the return of effusion. We have used oleothorax in order to maintain a collapse in the presence of obliterative pleuritis in intrapleural pneumothorax and have yet to find a reason for considering this treatment unsafe.

For the first six to eight weeks following operation frequent refills should be given, at least twice a week, always preceded by fluoroscopic study. After this period of time, the usual extrapleural pneumothorax becomes well established and the interval of refills can be extended. Following several months of collapse, only small amounts of air are required, and we have found that it is safe to stretch the interval in some cases to as much as three weeks between refills. We have converted seven of the group to oleothorax. This is a very satisfactory procedure for permanently maintaining collapse of the pathology and frees the patient of the necessity of returning for frequent refills.

In the following analysis of this series the complications encountered will be particularly stressed as well as presenting a description of the type of case selected for the procedure and the results following the establishment of extrapleural pneumothorax. From the standpoint of age and sex this group is similar to any group of candidates for thoracoplasty. It consisted of nine women and eleven men, ages ranging from twenty-one to forty-seven. Table I is an attempt to classify the results by the patient's condition, dividing them into three groups according to the condition of the contralateral lung.

TABLE I. EXTRAPLEURAL PNEUMOTHORAX

	Number	Results
Contralateral Lung Negative or Minimal Inactive	*6*	
F.A. pneumonic with cavity	1	Dead
Collapsed lung M.A. with cavity	4	Satisfactory
Minimal progressive	1	Satisfactory
Contralateral Lung Extensive Quiescent or Retrogressive Lesion	*12*	
M.A. with cavity	4	Satisfactory
F.A. with cavity	7	Satisfactory
F.A. with cavity	1	Unimproved
Contralateral Lung Progressive Lesion	*2*	
F.A. with cavity	1	Dead
Collapsed lung M.A. with cavity	1	Satisfactory

*F.A. stands for "far advanced" and M.A. for "moderately advanced."

It will be noted that in twelve patients the contralateral lung was involved by an extensive quiescent or retrogressive lesion which was the main indication for this procedure rather than thoracoplasty. Two of these patients each had two operations, one having a bilateral extrapleural pneumothorax later converted to bilateral

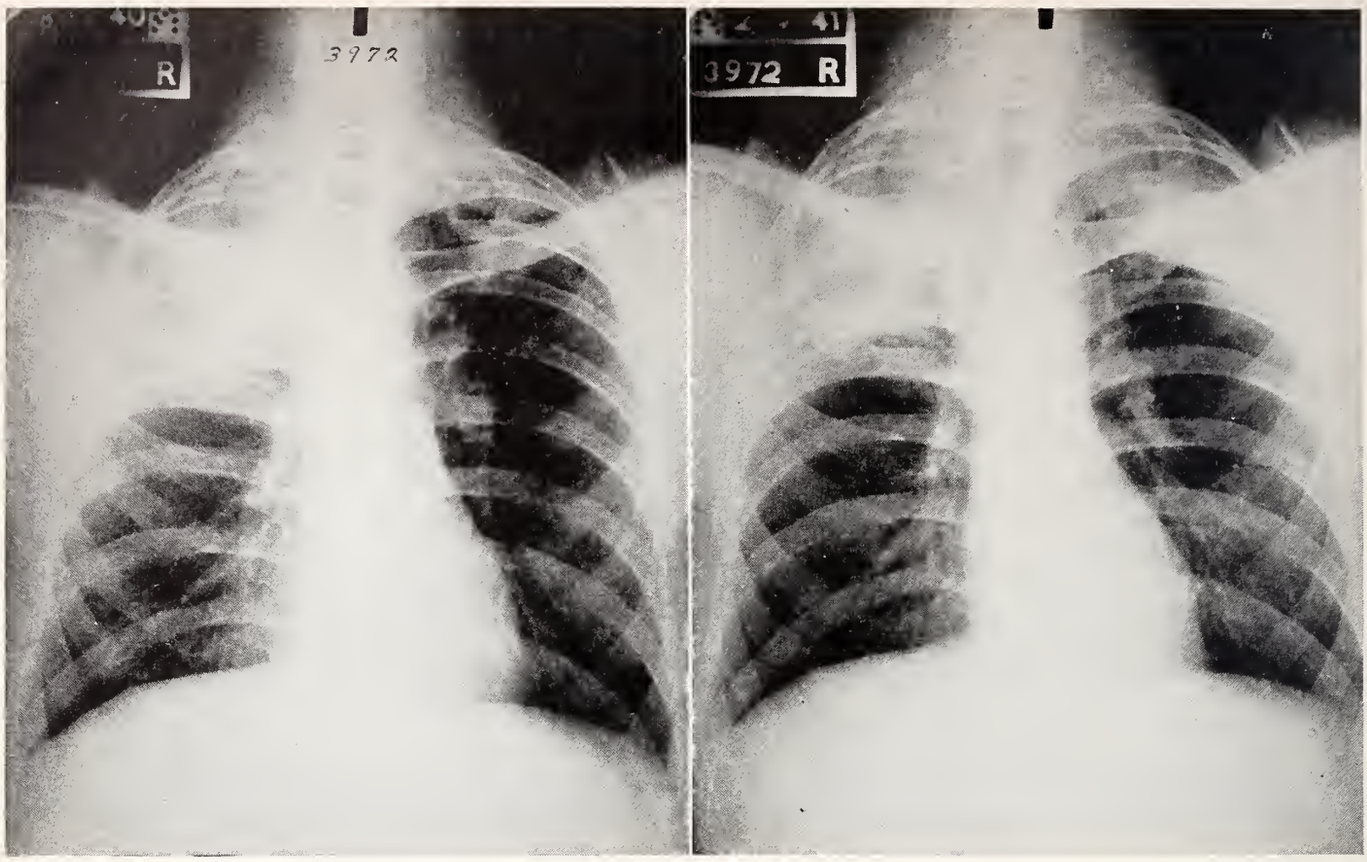


Fig. 1. Roentgenograms before and after bilateral extrapleural oleothorax. The cavity in the apex of the contralateral lung developed six months following the pneumonolysis done on the right side. Maximum functioning of uninvolved lung maintained on both sides.

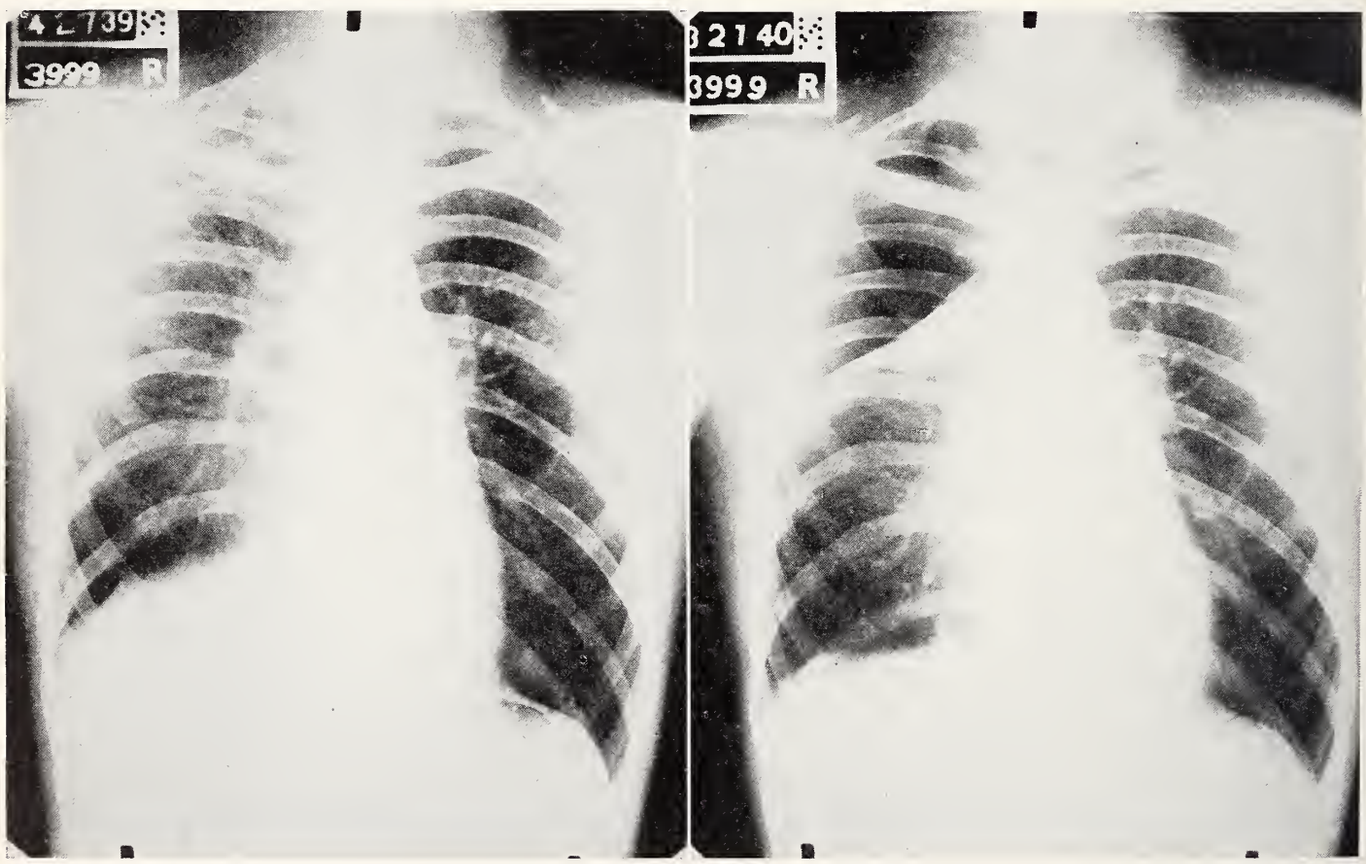


Fig. 2. Roentgenograms before and after the establishment of an extrapleural pneumothorax on the right side with a recent progressive lesion in the midportion of the left lung. Closure of cavity, conversion of sputum, as well as clearing of the contralateral lesion resulted.

oleothorax (Fig. 1) and the other had a secondary pneumonolysis in order to increase the size of her pneumothorax. This group also includes the two cases in which bronchopleural fistula occurred, one having a subsequent thoracoplasty with eventual satisfactory results. The other, now being treated by intercostal catheter drainage and classified as unimproved, is now being prepared for thoracoplasty.

Two of the series had progressive lesions in the contralateral lung at the time of operation. Of these, one died postoperatively of bronchopneumonia and in the other (Fig. 2) the result is satisfactory with subsequent improvement of the contralateral lesion. The remaining group of six had essentially negative contralateral lungs. In one the operated lung was involved with an advanced pneumonic infiltration throughout the upper lobe with cavitation. The remaining five, in whom all the results were satisfactory, might have been subjected to thoracoplasty. Three were young women with progressive lesions limited to the upper lobe which failed to stabilize on bed rest alone. Extrapleural pneumothorax was selected rather than thoracoplasty as the less radical of the two procedures. Extrapleural pneumothorax was chosen in the remaining two who had lesions with cavity involving only a small portion of the apex. Less good lung was sacrificed to control the pathology than would have been had thoracoplasty been the procedure used.

Table II is a list of the complications occurring in our group together with treatment and results.

While complications occurred following extrapleural pneumonolysis in nine patients they were of a serious nature in only five cases, causing death in two patients. The low grade empyema listed was easily controlled by oleothorax and did not affect the final results. Thirteen operations performed on the remaining eleven patients were attended by no complications.

Table III summarizes the results of the series as a whole.

TABLE II. EXTRAPLEURAL PNEUMOTHORAX

Cases	Complications	Treatment	Result
1	Empyema with contralateral spread	Irrigations	Dead
1	Postoperative pneumonia	Oxygen therapy	Dead
2	Bronchopleural fistula	1 Thoracoplasty 1 Intercostal drainage	Satisfactory Unimproved
1	Mediastinitis with loss of air space	Irrigations	Satisfactory
4	Empyema (low grade)	Oleothorax	Satisfactory

TABLE III. EXTRAPLEURAL PNEUMOTHORAX

	No. Patients
Satisfactory	16
Thoracoplasty required	1
Unimproved	2
Dead	2

The sixteen patients in the first group include one having a bilateral extrapleural pneumothorax and one having a subsequent lysis to increase the collapse of the original pneumothorax, making a total of eighteen operations. The case listed as unimproved is to be submitted to thoracoplasty in the near future in the hope of improving his status. The relatively high mortality is due to the application of this procedure to a group of patients including many who would be considered too poor a risk for thoracoplasty.

Discussion

While our series of cases is too small and our experience too short to warrant definite conclusions regarding the procedure of extrapleural pneumothorax, we have been impressed with the value of this procedure. In the hands of men trained in pneumothorax therapy, popularity of this procedure is bound to increase. Too much emphasis cannot be placed on the proper postoperative care of the collapsed lung. No other surgical procedure, with the exception of paraffin pack, can produce as efficient anatomical collapse of the disease with such a minimum loss of functioning lung, and it has its advantage over the paraffin pack in that the extent of collapse is not limited. The operation itself was withstood well by the patients and can be tolerated even by

those in whom toxemia is marked. The rapid collapse of the pathology resulting from the procedure seems to have no appreciable effect on the patient's condition. The reaction of the patient is not greater than that following an upper posterior stage thoracoplasty.

One of the most gratifying features of this procedure has been the rapid conversion of sputum. In fourteen of the eighteen surviving cases all specimens of sputum examined following establishment of pneumothorax have failed to reveal tubercle bacilli. These examinations have consisted of 24-hour specimens which had been concentrated in the usual way before being examined for the bacilli. Of the remaining four, one became negative two months following surgery; another, in which a bronchopleural fistula developed, remained positive until thoracoplasty was done seven months later. Of the remaining two, both operated upon within the past two months, one has cavitation in the contralateral lung, and in the other the cavity under the pneumothorax is still patent.

The complications following this procedure will be reduced, we are sure, with proper postoperative treatment. Empyema occurring is not usually as serious as in intrapleural pneumothorax and can be controlled by irrigation through the acute stage, followed by oleothorax. Bronchopleural fistula is the most serious complication of this procedure. While it has been felt that giant cavities with thin walls are very likely to necrose due to disturbance of circulation, the experience of Proctor and others has been that this does not generally occur.

When permanent collapse of the pathology is desired, it seems practical to us to convert the extrapleural space to an oleothorax. We have used this method for maintaining collapse in intrapleural pneumothorax where obliterative pleuritis has occurred and, after five years' experience, we have found no reason to discontinue it. We feel that extrapleural pneumothorax should be used not as a preliminary procedure to thoracoplasty but that this latter procedure is to be reserved only for the treatment of such complications as bronchopleural fistula and uncontrolled empyema. Extrapleural pneumothorax should not replace thoracoplasty. Except in a few cases we do not feel that our indications for thoracoplasty has changed but rather that the procedure of extrapleural pneumothorax widens the field of collapse therapy and provides us with an additional surgical procedure to be offered to a group of patients in whom formerly conservative treatment alone could be used.

We would like to group under the indications for extrapleural pneumothorax the following four groups:

1. Bilateral disease where preservation of the functioning lung is paramount. Where intrapleural pneumothorax has failed and the lesion to be collapsed is too extensive to use paraffin pack, extrapleural pneumothorax is the only procedure that can be safely offered to the patient.

2. Progressive lesions failing to stabilize sufficiently for thoracoplasty.

3. The "indolent" tuberculous lesion. Under this group, we mean to include those in which the extent has never become great, where cavity may or may not be present, but in which arrest of the lesion is not secured by bed rest with or without phreniclasis, and in whom intrapleural pneumothorax has been unsuccessful. These cases usually are young adults who have spent years in and out of the sanatorium. The lesions have never progressed to the stage where the patient or the doctor is willing to accept thoracoplasty as inevitable. In this group the reaction to surgery is minimal; the resulting extrapleural pneumothorax is very seldom accompanied by complications; and there is often a definite tendency of the collapsed lung to re-expand. We have noted this in a few of our cases over our short period of observation, and it has also been reported by Proctor, whose experience dates back to 1935. We feel that this group should be given the benefit of the possibility that their lung might re-expand after having been collapsed long enough to control the disease.

4. The progressive lesions of children. Included in this group are the lesions which begin as minimal and gradually spread, without cavitation or symptoms, in spite of the long trial of best rest. For several years we have felt that whenever possible this group should be treated by pneumothorax, as their eventual prognosis is not good. On the other hand, we have hesitated to consider thoracoplasty, particularly when cavitation and positive sputum are not present. As a result many of these patients have been kept on bed rest for long periods of time and have been eventually discharged only to be readmitted with further involvement of their lungs. We feel, for the same reason as given under the third group, that extrapleural pneumothorax is the procedure of choice. In addition to these reasons, the deformities such as scoliosis, so often seen when thoracoplasty is performed on the immature, are avoided.

Summary

A description of the procedure of extrapleural pneumonolysis for the production of extrapleural pneumothorax has been given together with an outline of proper aftercare. A presentation of our series of cases with a description of the complications encountered and the treatment of these has been given. A discussion of our impressions resulting from observation of this series particu-

larly stresses the efficiency of sputum conversion, the minimum of good lung sacrificed, and the importance of proper postoperative care. The use of oleothorax in maintaining permanent collapse rather than subsequent thoracoplasty has been advised.

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THE RETINAL MANIFESTATIONS OF SUBACUTE BACTERIAL ENDOCARDITIS*

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RETINAL hemorrhages of different types are commonly noted in subacute bacterial endocarditis. They appear and disappear at various intervals during the illness, often leaving little or no trace of their existence. Moore[6] states that hemorrhages occur at sometime during the course of the disease in almost all instances. Friedenwald and Rones[3] believe that the so-called "septic retinitis" first described by Roth[5] is rather characteristic of subacute bacterial endocarditis. Typically, this variety of retinitis consists of petechial hemorrhages with yellowish or white centers. Even more significance has recently been attached to these or similar lesions by Doherty and Trubek[1] who describe elliptical hemorrhages with white centers and state that they may be of aid in the early diagnosis of endocarditis.

Embolism of vessels of the retina and choroid is known to occur and is productive of various ophthalmoscopic pictures. Middleton and Burke[5] found embolism of the central artery of the retina but once in a series of eighty-eight cases.

Mention of involvement of the disk in subacute bacterial endocarditis has been omitted in the recent literature. Falconer, in 1910,[2] noted the occurrence of optic neuritis, but since his report, allusion to changes in the disk has been found but three times, *i.e.*, in the reports of Yater and Wagener, in 1929,[9] Friedenwald and Rones, in 1930,[3] and Middleton and Burke, in 1939.[5]

My interest in the disk lesions in subacute bacterial endocarditis was aroused by the observation of marked papilledema in a patient having normal spinal fluid pressure recently studied on the Medical service of the University of Minnesota Hospital. The present study was made in order to determine the incidence of disk involvement in subacute bacterial endocarditis and to determine the degree of correlation of these lesions with other manifestations of the disease.

Material

The case records of sixty-seven patients having subacute bacterial endocarditis were examined. All of these had been hospitalized since January, 1929. From this group thirty-seven cases were selected for study. These were chosen on the basis of a positive diagnosis together with a report of examination of the fundi. The diagnosis was confirmed by autopsy in seventeen instances. A record of positive blood culture was noted in all cases except one, but in this the diagnosis was confirmed at necropsy.

Results

The results of the investigation are given in the accompanying tables. Table I includes the results for Groups A and B, the cases with abnormal ophthalmoscopic findings. Group A includes those with disk involvement, Group B those with retinal changes alone. Group C, in TableII,* includes cases in which the fundi were normal.

Comment

The relatively high incidence of lesions involving the optic disk is noteworthy. Thirteen cases or 35 per cent of the series showed disk pathology.

Case number eight of Group A will not be included in the ensuing discussion since, in the

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*See page 242.

TABLE I—GROUP A

Case No.	Approximate Duration	Ophthalmoscopic Findings		Blood Pressure	Temperature	Hgb. %	Leul cyt
		Disk	Retina				
1	12 mo.	Bilateral papilledema, 3 diopters.	Peripapillary edema "boat" shaped hemorrhages with white centers. Pre-retinal hemorrhage in right eye. Several small choroid hemorrhages around indistinct nerve margins.	96/70	Spiking 102.8°	70	16,0
2	1½ mo.	Some blurring of right.	One large petechial hemorrhage in left eye.	100/60	Spiking 102.6°	65	12,0
3	1 mo.	Suggestion of early optic neuritis of left eye.		124/72	Spiking 103.8°	73	16,5
4	5 mo.	Right: Edematous, margins indistinct. Left: Definite edema. Venous pulsation.	Right: Details hazy as if hidden by a diffuse edema. Just below macula a patch of grayish-white exudate with a hyperemic border. Left: Two large patches of exudate along vessels.	128/70	96° to 100.4°	55	10,0
5	8 mo. (?) or 1 wk.	Right: Elevated 2 diopters. Left: Elevated 2 to 3 diopters.	Left: Some flame-shaped hemorrhages scattered over fundus, especially near the disk.	104/70	Spiking 103°	47	11,0
6	3 mo.	Bilateral optic neuritis.	Slight diffuse retinal edema. Many flame-shaped hemorrhages in both retinæ. Large petechial hemorrhage in macular area on right. Area of exudate (or retinal degeneration) in superior temporal quadrant on right.	110/70	Spiking 103.4°	45	28,5
7	4 mo.	Bilateral choked disks, 1 - 2 diopters.	Circumpapillary edema extending out to adjacent retina. Old flame hemorrhages.	110/70	Spiking 102°	70	14,0
8		Blurred margins.	Petechiæ on subsequent examinations.	134/84	Spiking 104°	42	14,
9	4 mo.	Blurred disks.	Hemorrhage in left.	115/72	Spiking 102°	60	9,
10	6 mo.	Suggestive hemorrhage of right.	Pale fundi.	125/48	Spiking 102°	38	4,
11	5 mo.	Old and fresh hemorrhages of right.		80/62	Spiking 103.4°	62	6,
12	7 mo.	Hemorrhages about the nerve heads.		118/80	Low 98°	45	11
13	13 mo.	Slight bilateral optic atrophy.		98/64	Spiking 103.8°	58	12

TABLE I—GROUP A

Gr.	Urine: Alb.	Urine: Casts	Urine: R.B.C.	Urine: W.B.C.	External Petechiæ	Cerebral Manifestations	Visual Disturbances	Spinal Pressure	Blood Culture	Remarks
11	1+	hyaline granular,& leukocytic	num.	num.	+ Showers	Cerebral accident one month before admission. Rt. hemiplegia.			non-hemolytic Strep.	
18	tr.	0	0	0	+	Four months later had cerebral embolus with resultant left hemiplegia, aphasia and + right Babinski.			Strep. Vir.	
5	tr.	occ. gran.	0	occ.	+	Right hemiplegia, aphasia.			Strep. Vir.	
5	0	0	few	few					Strep. Vir.	
	tr.	0	occ.	many	+		Patient noted failure of vision 5 days after exam.		Strep. Vir.	
5	1+	0	0	occ.	+		Periods of transient blindness left eye 3 mo. prior to admission		Strep. Vir.	
2	1+	gran.	20 to 30 per h.p.f.	10 to 15 per h.p.f.	+			Normal 14 to 22 to 14 mm. Hg.	Strep. Vir.	
6	3+	occ. gran.	occ.	many	+			18 to 30 to 18	Staph. Diphth.	4+ Wass.
	tr.	0	0	few	+ later				Strep. Vir. & Staph.	
	3+	0	100 per h.p.f.	18 per h.p.f.	+				Microæro Strep.	
2	1+	0	few	num.	+	Right hemiplegia(?) Disoriented. Neck rigidity. +Kernig(?)				
0	2+	0	num.	v. occ.	+	Hemiplegia.			Previously positive	
5	tr.	0	0	0	+	Right hemiplegia.	Photophobia 6 weeks		Strep. Vir.	

TABLE I—GROUP B

Case No.	Ophthalmoscopic Findings		Blood Pressure	Temperature	Hgb. %	Leukocytes
	Disk	Retina				
1		Small patch of brownish-black pigment in right eye.	112/60	Low 98°	70	14,350
2		Oval hemorrhagic-like area in lateral left fundus.	130/64	Spiking	65	12,700
3		One petechia in left retina.	130/50	Spiking 104°	58	9,900
4		Flame hemorrhage in left. Subretinal hemorrhage in right.	122/67	Spiking 102.6°	41	8,800

presence of a four plus Wassermann reaction, lues could not be excluded as the cause of the blurred disk margins.

Exact classification of the disk lesions is extremely difficult. Several possibilities present themselves: optic neuritis, papilledema, embolic neuroretinitis, or combinations of these. Troncoso[7] mentions intermediate forms between optic neuritis and papilledema that can be differentiated clinically only on the basis of the type of visual disturbance present.

There are several possible factors in the pathogenesis of these lesions. Toxemia, a mechanism which Falconer[2] favored, probably is of importance. Embolic processes in the retinal vessels should receive serious consideration. Nearly one-half of those cases with disk lesions showed evidence of emboli in the cerebral circulation either shortly before or after the report of the funduscopic examination. Since the retinal and cerebral circulations are so intimately related, it is easy to suppose that emboli would also lodge in the retinal vessels. This was found to be the essential pathology in Friedenwald's first case.[3]

Increased intracranial pressure as a cause of the edema of the nerve heads must be considered. In the present group the one reliable spinal fluid pressure reading was within normal limits, so the edema in at least one instance was not due to increased pressure.

Middleton and Burke's case number four developed cerebral hemorrhage from a mycotic aneurysm. The eye findings of an optic neuritis were present before symptoms of the hemorrhage occurred, but could have been the result of some leakage over a period of days.

Another factor known to cause abnormal funduscopic pictures is severe anemia.[1,4,7,9] Low hemoglobin values are noted in Groups A and B (with retinal pathology), but comparable reduction is also observed in Group C (without changes in the eyegrounds).

Reference to the tables will reveal that petechiæ are not always present in the cases showing disk lesions. No petechiæ could be found in case number four of Group A, although thorough searches evidently were made. However, it is of interest to note that in Group A, 91.6 per cent (eleven cases) exhibited external petechiæ, although they were recorded in but 55 per cent (eleven cases) of Group C.

Cerebral embolic phenomena occurred seven times in the entire series of thirty-seven cases. Six of these were among the group with nerve head pathology. Thus it is clear that disk pathology can be expected with considerable regularity in those cases of vegetative endocarditis showing evidence of cerebral emboli.

Variations in blood pressure, temperature, and leukocyte count failed to reveal significant correlation with the occurrence of nerve head lesions. Abnormally high blood pressures were not observed. The temperature elevation and leukocyte counts varied in approximately the same manner throughout the entire series. Most of the cases of Group A exhibited high leukocyte counts, but there are numerous counts just

TABLE I—GROUP B

Urine					External Petechiæ	Cerebral Manifestations	Visual Disturbances	Spinal Pressure	Blood Culture
Sp. Gr.	Alb.	Casts	R.B.C.	W.B.B.					
1.020	0	0	0	occ.					Strep. Vir.
1.017	tr.	num.	5 to 10 per h.p.f.	2 to 4 per h.p.f.					Strep. Vir.
1.008	tr.	num. hyaline	num.	few	+				Staph. later Strep.
1.008	1+	0	occ.	num.	+	Cerebral embolic phenomena	Impaired before adm.		Previously positive

as high among those of Group C. Urinalysis also demonstrated no outstanding abnormality characteristic of one group more than another.

Visual disturbance is, as one would expect, the one finding that seems definitely confined to the group with nerve head changes (Group A). The surprising fact is the relatively infrequent occurrence of visual disturbance in this group, although it is possible that there were some instances that were not recorded.

Falconer[2] believed that the finding of optic neuritis aids in making an early diagnosis of vegetative endocarditis. Therefore, it would be interesting to determine the amount of time which elapsed between the onset of symptoms of the disease and the appearance of the disk lesions. No conclusions bearing on this point can be drawn from the present study because the onset of the papilledema was exactly dated in but one case (number seven in Group A).

Summary and Conclusions

1. The subject of retinal findings in subacute bacterial endocarditis has been discussed and the literature has been reviewed briefly.

2. Thirty-seven cases of subacute bacterial endocarditis were selected for study on the basis of a positive diagnosis and a record of ophthalmoscopic examination.

3. Study of this series reveals that:
   a. Nerve head lesions are not infrequent, being present in 35 per cent of the cases.
   b. The nerve head lesions are correlated to some extent with visual disturbances and cerebral accidents. Blood pressure, temperature, hemoglobin, leukocyte count, and urinary study showed no correlation. Petechiæ are more consistently found in the cases with disk pathology.
   c. Marked bilateral papilledema may be present in vegetative endocarditis without elevation of the spinal fluid pressure.

4. More emphasis should be placed on ophthalmoscopic examination in subacute bacterial endocarditis, with particular attention paid on the condition of the nerve head. Eyeground abnormalities may prove of aid in diagnosis.

The writer gratefully acknowledges the advice of Dr. C. J. Watson in preparation of this manuscript.

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TABLE II

GROUP C (Negative Ophthalmoscopic)

Case	Blood Pressure	Temperature	Hgb.	Leukocytes	Urine					External Petechiae	Cerebral Manifestations	Blood Culture
					Sp.Gr.	Alb.	Casts	R.B.C.	W.B.C.			
1	120/78	Spiking 102°	45	15,900	1.014	2+	gran.	3 – 4	100 per h.p.f.			Strep. Vir.
2	94/72	100.2° to 101° (R)	68	31,700	1.025	tr.	hyaline	few	few	+		Strep. Vir.
3	112/62	Spiking 102°	54	6,900		1+	0	occ.	occ.			Strep. Vir.
4	120/74	Low 98.2°	40	12,300	1.012	1+	0	many	few	+		Strep. Vir.
5	128/70	Spiking 103°	70	16,500	1.012	0	0	occ.	0	+		Strep. Vir.
6	85/56	Spiking 101°	70	8,700	1.027	ft. tr.	0	occ.	occ.			Staph. Alb.
7	96/70	Spiking 102°	57	9,800	1.014	0	0	0	0	+		Strep. Vir.
8	82/36	Spiking 103	40	11,500	1.010	2+	0	0	few	+	Mult. cereb. acc.	Strep. Vir.
9	96/60	Spiking 103	56	6,000	1.022	0	0	0	few			Strep. Vir.
10	94/58	Spiking 102°	69	13,950	1.030	0	0	0	0			Strep. Vir.
11	110/70	Spiking 103°	67	19,400	1.027	tr.	0	occ.	occ.	+		Strep. Vir.
12	97/67	100°	140	10,700	1.020	Cl.	hyaline gran.	many	few			0
13	130/66	Spiking 101+°	103	7,100	1.020	0	0	0	0	+		Strep. Hem.
14	134/78	Spiking 102°	56	6,300	1.014	tr.	0	0	few	+		Strep. Vir.
15	75/50	Spiking 102°	41	20,100	1.013	1+	num. gran.	few	num.	+		Strep.
16	122/70	Spiking 102°	66	4,600	1.021	1+	num. gran.	very occ.	occ.			Strep. Vir.
17	148/50	Spiking 103.4°	54	5,500	1.018	1+	occ. gran.	0	very occ.	+		Strep. Vir.
18	108/80	Spiking	57	7,400	1.016	2+	0	0	many			Strep. Vir.
19	126/54	Spiking 102°	78	8,900	1.020	0	0	loaded				Strep. Vir.
20	120/70	Spiking	64-54							+		Strep. Vir.

There were no visual disturbances nor spinal pressure recorded in any of the cases here listed.

TREATMENT AND END RESULTS IN APPENDICITIS*

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FOR several years there has been an intensive campaign intended to educate the public on the subject of appendicitis. This education encompasses two chief objectives: (1) admonition against the use of cathartics in the presence of abdominal pain and (2) advice to seek medical counsel early when abdominal pain is present.

The motive is to prevent complications of acute appendicitis from developing since it is conceded that the chief mortality is in the complicated cases. However, there is another phase to the reduction of appendicitis mortality and that rests squarely on our shoulders as physicians. This is to reduce the mortality of complicated appendicitis by improved treatment. This will create an immediate marked decrease in appendicitis deaths. Bowers,[2,3,4] in Philadelphia, is doing remarkable work in reducing appendicitis deaths in that city and the same measures can be undertaken everywhere by organized groups such as state or county medical societies.

Teachings of Wilkie and the recent work of Wangensteen[16,17] regarding the etiology of appendicitis leaves little doubt as to the cause being obstructive in the majority of cases. This obstruction may be caused by various factors: kinks, bands, retrocecal fixation, strictures or lymphoid tissue swelling; and with a normal luminal resistance to outflow, appendicitis may ultimately be produced.

Classification

A classification is used that is based on the gross pathology seen at the time of operation. This is most useful in interpreting end results from various methods of surgical treatment (Table I).

In the first group are included interval appendicitis, mildly acute, subsiding and chronic appendicitis. Obviously, each differs in the clinical picture but they are similar in methods of treatment and mortality.

The second group is that of acute appendicitis and consists of all cases in which the appendix is acutely inflamed or obstructed, in which perforation has not occurred and the peritoneum is not seriously involved.

TABLE I. CLASSIFICATION OF CASES
(At Operation)

	Average of Collected Cases from Literature (Percentage)	Author's Series (Percentage)
Interval, Chronic, Subsiding and Subacute Appendicitis	20 to 25	16.6
Acute Appendicitis	50 to 60	65
Acute Appendicitis: Ruptured with Early Peritonitis, Localized Peritonitis or Appendiceal Abscess	15	13
Acute Appendicitis: Ruptured, with Diffuse or Generalized Peritonitis	5 to 8	5.4

In a third group are placed cases of acute appendicitis, usually ruptured, with localized peritonitis or appendiceal abscess. The factor of time is not considered as of value in classification but rather the extent of the lesion.

In the fourth group are placed the peritonitis cases of unlocalized extent. The term diffuse peritonitis is preferred to all other terms as being the truest one to represent this condition rather than spreading or generalized peritonitis. It has been demonstrated that true generalized peritonitis occurs rarely.

Mild and Chronic Appendicitis

In the indications for operation, it is believed that appendectomy is justified in the interval following an acute attack. Conservatism is desirable in performing interval operations when the patient has not been personally seen in an acute attack.

Some believe that a diagnosis of chronic appendicitis is not warranted; others believe it

*From the Two Harbors Hospital. Read before the annual meeting of the Northern Minnesota Medical Association, Duluth, Minnesota, July 19, 1940.

quite common and operate accordingly. The majority believe that it does occur, that it is not common and that a most careful exclusion diagnosis is necessary before operation is justified.

Shelley[15] reports the follow-up of 704 patients operated on for chronic appendicitis. The highest percentage of cure in this group was obtained in patients with evidence of inflammatory change or obstruction found at operation. Patients with findings of tenderness in the right lower quadrant and muscle spasm and not showing evidence of acute inflammation pathologically obtained as much relief from operation as those showing acute inflammation. Many of those were doubtless cases of appendical colic so recently elaborated by Cherney.[5]

Rea and Kleinsasser[14] in a follow-up study of 143 cases operated with a diagnosis of "inactive appendix" point out the interesting fact that many patients recover from appendical colic who show no pathologic changes in the appendix.

Acute Appendicitis

There may be considerable difference of opinion regarding the frequency or indications for chronic or interval appendectomies, but there is practically universal agreement that in uncomplicated acute appendicitis, immediate operation is indicated. The manner of removal is not nearly so important as the necessity for removal. There is wide variation in the severity of the pathologic picture in this group from the mild to the gangrenous.

The surgical approach in appendectomy has many variations and all methods have their exponents. McBurney's incision or some modification is the most commonly used incision and many surgeons use it routinely. The appendix occasionally is found in an unexpected situation in which the McBurney incision increases the technical difficulties. In the majority of cases, the clinical examination will determine approximately the best method of approach to the appendix and will also give a clue as to the possibility of an abnormally situated organ. Consequently, a routine incision is not always desirable but it must be tailored to the case.

The paramedian incision over the right rectus muscle retracting the muscle laterally in its sheath fulfills every requirement for a satisfactory appendectomy. Extension of the incision is easily accomplished and other organs examined or treated surgically as necessary. The Battle incision or some modification is used by many surgeons.

The surgical technic will not be discussed except to emphasize adequate and complete hemostasis, use of fine catgut, use of suction rather than gauze to remove exudate or blood, protection of the abdominal wound from infected peritoneal contents and avoidance of gauze intraperitoneally. The stump is treated with phenol and alcohol though no harm has been observed by omitting this step. The stump of the appendix is inverted. The practice of inverting the stump is one that has been used by a number of surgeons for many years. It appears to be a more surgically clean method than leaving the ligated stump free or buried in the meso-appendix or omentum. Certain requisites are necessary for inversion: control of all bleeding, avoiding the puncture of vessels in placing the purse string suture and a cecal wall not seriously involved in the inflammatory process.

On the basis of experimental studies, Donaldson[6] concluded that inverting the stump was preferable and Kross[11] concluded that inversion resulted in complications, so experimental evidence does not seem to be uniform.

If drainage is indicated, and it rarely is, a Penrose drain is used. The wound is closed with fine chromic catgut interrupted sutures. Tension sutures are not used inasmuch as they never assume tension but merely approximate the subcutaneous tissues and these can be approximated more efficiently by direct suture with fine interrupted plain catgut sutures. The dressing is seldom changed until time for the removal of the skin sutures or clips unless wound inspection is desired or drainage has been used.

Treatment of Localized Peritonitis

The treatment of complicated acute appendicitis with peritonitis requires for success the full measure of knowledge, skill and judgment of the surgeon.

While immediate operation is indicated in uncomplicated acute appendicitis, it is not always so highly recommended when perforation or signs of peritonitis are present. Usually these patients have been sick a longer period of time or at least the lesion is more extensive. Their condition is not always ideal for immediate operation and corrective measures can be instituted

before operation that will in a short period of time better enable them to withstand surgical intervention and the immediate postoperative stage. The toxicity can be corrected by fluids, intravenously or subcutaneously, transfusion, if necessary, rest and relief of pain. Also, the diagnosis is not always entirely obvious at the time of admission and observation is advisable to obtain more information before making a decision, during which time these measures can be carried out. Operation is preferred in all cases of this class or thought to be in this class after the dehydration has been corrected and any other toxic symptoms relieved. This practice of operation after correcting toxicity is early operation as contrasted with immediate operation.

Appendical abscess is treated in the same manner. An abscess is merely a stage of localized peritonitis and, consequently, deserves treatment on the basis of pathology rather than size or duration of the lesion. When the abscess surrounds the appendix and is small and mobile, it may be removed in its entirety; otherwise, the effort is made to open into the abscess and protect the uninvolved peritoneum. The appendix is removed in all cases of perforation and of localized peritonitis, if possible. In the occasional case, removing the appendix may entail the separation of barriers best judged to be left undisturbed. The appendix was removed in all cases reported in this series.

Drainage is usually but not always practiced with localized peritonitis. Well walled-off perforations with a small amount or possibly no pus present do not always require drainage even with some inflammatory reaction in the surrounding tissues. In the presence of frank pus, localized or unlocalized, drainage is usually indicated. When draining, a Penrose drain gives satisfactory results, one usually being sufficient to insure a sinus formation.

In the postoperative management, these cases are treated similarly to those of diffuse peritonitis.

Treatment of Diffuse Peritonitis Complicating Acute Appendicitis

There has been great controversy in the method of treatment of this truly serious surgical disease. The deferred method or Ochsner treatment of appendicitis with peritonitis has many advocates[1,8,12] who cite very good results with this method. Equally good results are reported by other surgeons[9,10,13] using early operation as the method of choice. The chief principle in the deferred method is absolute rest of the gastrointestinal tract. This consists in the use of continuous gastroduodenal suction, relief from pain, a balanced intake of water, minerals, intravenous dextrose and blood, and bed rest. Abscess formation is treated by surgical drainage if the abscesses do not resolve spontaneously. After the symptoms and signs have subsided and the patient recovers, the appendix is removed by interval appendectomy two to four months later.

The objection to unqualified use of the deferred treatment in peritonitis is that this treatment is best reserved for only a small percentage of cases and it is not always easy to say which cases fall into this group. Each case must be individualized. There is no assurance that a hospital bed, ice bag, morphine and fluids will necessarily result in subsidence of a peritoneal infection. Also, it is difficult to say just when peritonitis is present, and, if present, whether it is spreading or stationary. It is the contention of Ochsner that spreading peritonitis is definitely harmed by operative trauma. Ochsner admits that conservative treatment is very difficult and taxes the surgical judgment to the utmost and also states that the inexperienced surgeon will do better to operate on these patients than to institute conservative or deferred treatment. It may be pointed out, however, that a fundamental principle in the treatment of a diffuse peritonitis may be the removal of the source of infection. In some cases of diffuse peritonitis there is a continuous leakage taking place from the perforated appendix. Furthermore, the occurrence of localization in any one case is not certain. Even if localization occurs, it may break down into a diffuse peritonitis.

Immediate operation is to be condemned because it carries a high mortality. These patients are in poor general condition because the lesion is extensive, they are dehydrated by vomiting, and they are weak because of lack of rest caused by the pain. With operation superimposed upon this poor general condition, a high mortality results. As opposed to deferred treatment or immediate operation is treatment by early operation. Again the definition of early operation is operation after the general condition of the patient has been improved to the maximum by cor-

rection of toxicity, dehydration and exhaustion. Obviously, no definite rules can be laid down as to when the patient is in the best condition. The judgment of the surgeon must be the final deciding factor rather than any one laboratory procedure or any sequence of symptoms. "The extent the lesion has affected the individual is more important than the extent of the lesion." (Elman[7])

In the usual patient admitted with diffuse peritonitis, absolute rest is insisted upon in so far as compatible with treatment. Intravenous saline and dextrose solutions are given and blood if indicated. Gastroduodenal suction is started and morphine is given for the relief of pain if the diagnosis is unquestioned. Within a few hours, improvement is usually noted, and the patient is then operated upon with a better chance of recovery. The surgical approach is carefully determined on the basis of examination and the probable location of the appendix. Operation itself is carried out rapidly but not at the expense of gentleness or omission of necessary steps. Suction is used to remove all peritoneal exudate or pus. The wound must be protected against contamination from the infected peritoneal contents. The appendix should be removed and unless perforation is recent, drainage is instituted with one or more Penrose drains along the lumbar gutter and in the pelvis. The wound is either closed about the drain or up to and including the fascia of the external oblique muscle or the anterior rectus fascia and the subcutaneous tissues and skin are left open and secondary closure carried out later.

Good and adequate postoperative treatment is needed by these acutely ill patients. Gastroduodenal decompression is routinely practiced until audible peristalsis is heard. Five per cent dextrose with saline and alternately without saline is given slowly in adequate daily amounts as judged necessary by the urinary output. The relief of pain, of course, is continued with morphine in necessary dosage and frequency. Chemotherapy is used in most cases, depending upon the severity of the infection. Bacteriological findings of the material obtained at operation is seldom useful as a guide in the treatment.

Sulfanilamide has been used with increasing frequency in these cases, being administered intravenously immediately before or after operation and intramuscularly or subcutaneously with saline or other infusions thereafter. Ravdin[13] reports the use of sulfanilamide in 257 cases of acute appendicitis complicated by peritonitis with only one death. This is the lowest mortality appearing in the literature for a series of cases of this length and severity. He used an average of 8 Gm. the first day and reduced the dose each day thereafter depending upon observation. Transfusions were used somewhat oftener in his series of sulfanilamide treated cases. In the postoperative management, transfusions are frequently desirable even though indications are not imperative. While routine use of transfusion is not recommended, most of these patients will require one or more to supply protein if for no other reason. Children particularly seem to derive much benefit from transfusions, possibly because they require a proportionately greater amount of protein than adults. Gatch[9] has particularly emphasized the use of transfusions in these serious complicated cases in children and attributes his low mortality of .6 per cent to the more frequent use of transfusions.

It is believed from results obtained in the series of cases reported that early operation is a method of choice except in the rare case where an overwhelming infection is obviously present. However, the virulence of the infecting organism or organisms is a factor influencing the course of events.

There is one type of case that demands particular consideration. Patients who on admission present a high temperature of 104 to 106, a rapid pulse and signs of advanced systemic infection represent a virulent invading type of infection. A history of chills at the onset of the illness may be given but this does not necessarily indicate a virulent infection. These patients are restless and may be mildly irrational at times. The symptoms and signs of systemic infection dominate the picture. The abdominal symptoms may not be outstanding but signs of peritonitis are present. The infection will not be helped by immediate operation. Moreover, the patient will be less able to combat the infection in the lymphatics and blood stream after such an operation.

A routine peritonitis régime of treatment is instituted consisting of gastroduodenal decompression, fluids parenterally, relief of pain, and, in addition, measures to combat the infection must be instituted with emphasis on absolute rest, adequate chemotherapy and transfusions.

After recovery, appendectomy is done any time after three weeks. There may be recurrence. Consequently, too long a waiting period is not advisable. Roughly, one per cent of all appendicitis cases fall into this group which present, on admission, peritonitis with serious systemic invasion. These patients are always treated conservatively. If there is some doubt as to the patient being in this class, operation is carried out in preference to deferred treatment.

In the postoperative treatment of diffuse peritonitis, the watch for complications must be vigilant, and, when present, they should be recognized early and dealt with wisely. Administration of oxygen by nasal catheter or oxygen tent reduces the respiratory effort when abdominal distention is great and benefits the patient to a great extent. It is frequently desirable to administer vitamins, particularly when nourishment is not taken for a period of several days since the supply in the body tissues becomes rapidly depleted under such circumstances.

The most common complications are wound infection, and, second, abscess formation. Treatment of wound infection scarcely needs amplification. Adequate drainage is indicated, but this does not mean laying the entire wound open. Drainage and counter-drainage will suffice and the time of complete healing will thereby be shortened. Wound infection involving all layers will often result in postoperative hernia unless the patient is confined in bed for longer than the usual period (Table II).

Peritoneal abscess formation is usually indicated by persistence or secondary rise in the temperature curve but usually has been recognized previously or suspected when daily examination is made. An abscess near or about the appendix will often drain into the sinus provided by the drain. Subphrenic abscess, fortunately, is not a common complication, but must be considered when the presence of a hidden suppuration is suspected. Early drainage is necessary, depending upon the space involved.

TABLE II. COMPLICATIONS OF APPENDECTOMY

TYPE	Averages from Literature (Percentage)	Author's Series (Percentage)
Pneumonia	6	3
Wound Infection	5	6
Pulmonary Atelectasis	4	5
Intraperitoneal Abscesses	3.5	1
Fecal Fistula	1	1
Thrombophlebitis	1	0
Peritonitis	1	0
Subphrenic Abscess	.5	0
Pleurisy	.5	1
Liver Infection	.5	0
Embolism	.2	0

Appendicitis in Children

Acute appendicitis in children is the same disease and should be similarly treated. Generally it is stated that perforation occurs early in children. This may partly be due to the fact that the onset of the disease is recognized later in children. The loss of protein in the peritoneal exudate often results in protein deficiency in children. Consequently, they need transfusions oftener than adults.

Serum Therapy

From the European continent have come sporadic reports relative to the use of serum in connection with surgical treatment of appendicitis. This is in the nature of an antitoxin and is administered intraperitoneally as well as intravenously and intramuscularly. The reports to date have not been sufficiently comprehensive to establish this method as valuable in the treatment.

Mortality in Appendicitis

A survey of mortality in appendicitis published in the past two years gives us an average mortality rate of all types of cases of about 2.6 per cent. In collected series, the average mortality ranges from 0.4 to 5 per cent.

For different types of appendicitis, the rates vary. In chronic or interval appendicitis, there is practically no mortality. In acute uncomplicated appendicitis, the average mortality is 0.5 to 0.8 per cent. For acute appendicitis with localized peritonitis, mortality varied in different reports from 0.4 to 8 per cent. For diffuse peritonitis, the mortality in this series varied from 0.4 to 37 per cent.

The author reviewed a series of 114 consecutive cases of appendicitis treated at the Two Har-

bors Hospital within the past two years, 107 of which were personal cases. Among these, eighteen were for interval, chronic, subsiding or subacute appendicitis, seventy for acute uncomplicated appendicitis, fourteen for acute perforated appendicitis with localized peritonitis, and six complicated by diffuse peritonitis. In six instances appendicitis was diagnosed but no operation was performed because of the mildness of the attack or the patient's wish to defer operation. There were no deaths (Table III).

TABLE III

	Number of Cases	Average Age	Average Number of Previous Attacks	Complications Percentage	Mortality
Interval or Chronic Appendicitis	18	24	1.8	5.5	0
Acute Appendicitis	70	26	1	13	0
Perforated Appendicitis (Localized)	14	24	.6	36	0
Perforated Appendicitis with Diffuse Peritonitis	6	24	2	50	0
Appendicitis No Operation	6	36	.15		0

Conclusions

Indications for appendectomy in nonacute cases are broadened to include mild acute or so-called subacute appendicitis, appendical colic or appendiclausis, and cases seen in acute attack but not operated during the acute phase. Interval appendectomy is suggested as one means to decrease appendicitis mortality since cases of severe appendicitis with peritonitis usually give a history of definite previous attacks.

It is necessary to correct toxicity in most cases to obtain the lowest mortality in appendicitis complicated by localized or diffuse peritonitis.

In the treatment of these severe cases of appendicitis, the pre-operative treatment, the time of operation and the postoperative management are paramount to technic or type of operative procedure.

Early operation after adequate pre-operative treatment is recommended for all types of complicated appendicitis in preference to deferred operation except for the occasional case which presents the picture of a virulent invading systemic infection. Deferred treatment followed by appendectomy is recommended for the 1 to 2 per cent of cases comprising this group.

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APPENDECTOMIES*

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FOR the past few years I have been watching with interest some of the statistics on appendicitis. I have been surprised at the high death rates and I have noted that surgeons reporting from their own private practices have, on the whole, had lower mortality rates. That is, of course, entirely logical. At the same time, I have developed a few ideas, in no way new or original, the routine adoption of which have given us such good results that I feel it may be of interest to discuss them here and pass them on into literature to help swell the already overflowing volumes on this subject.

In the past fifteen years little or nothing has been added to help the physician solve the problem of diagnosis on appendicitis. During this period we have, however, obtained tremendous help in its treatment. We have learned to standardize treatment technic and in a small way this has helped to reduce our deaths. There is another factor to which we should give much credit and that is the improvement in the material we work with, such as our anesthesia, antiseptics, autoclaves, instruments, suture material, and especially the advancement and standardization of hospital sterilization technic.

It is not my object to attempt to emphasize or add anything to the diagnostic problem in appendicitis. There is one observation that I should like to record. It is my firm belief that the first man to examine a case of acute appendicitis is the man in the best position to make the diagnosis. The first, light, careful examination of the abdomen reveals the most information. I have always felt that a gas-filled, palpable cecum is one of the very important findings and as soon as one begins deep palpating over the cecal area this gas will pass off and many times, especially in retro-cecal appendices, the patient will immediately complain of less tenderness. I believe this finding, especially in the absence of an otherwise inconclusive picture, is a great help in arriving at an early diagnosis.

We wish to report today on a series of 219 consecutive appendectomies performed at St. Elizabeth's Hospital. Of these, 198 were done for acute or sub-acute appendicitis and were accompanied by no mortality. In twenty-one cases the appendix had grossly ruptured and peritonitis was established to either a very limited or an extremely generalized degree. There was one death or a 4.7 per cent mortality. This death was that of a fifteen-month-old infant who was moribund upon admission and an exploratory operation was advised since the history given by a very ignorant mother suggested an intra-abdominal accident and a peritoneal irritation other than appendiceal in origin.

It is true that this series of cases is small and a little hard luck can make the difference between a low or a high mortality rate. However, I feel it is large enough to permit some inferences.

The economic level of patients and the intelligence and general state of education of a community are important factors. I believe that here in Wabasha County the average patient is well informed, more so than in the average community or certain sections of the larger cities. There are relatively few who do not appreciate the seriousness of a persistant stomach ache and only the very ignorant will resort to laxatives. All these facts are important since it means that we see our appendicitis patients early. The public is more and more beginning to realize that an appendectomy done early in the course of disease is a simple thing with practically no risk. With modern sedatives and anesthesia it is a nice vacation and not a period of suffering.

As to the treatment, there is nearly as great a variety of opinions as there are surgeons operating, and mortality rates vary tremendously. For one thing, I feel that spinal anesthesia on those cases where it can be employed (and in appendicitis it can almost always be used) is by far the finest anesthesia for abdominal surgery. Our patients usually receive 2 capsules of seconal or nembutal one-half to three-fourths of an hour before operation and by perfecting the technic of spinal puncture we have been able to instill

*Read before the Wabasha County Medical Society, Plainview, Minnesota, October 10, 1940.

our anesthesia without the patient, generally in deep sedation, being fully aware of what is going on. With the coöperation of the anesthetist by engaging the patient in an interesting conversation much can be done to relieve the patient's apprehension. The result is that most patients will later confess that during the operation itself they actually had a good time. Post-operatively, in our experience, the spinal patients are much more comfortable and complications are less.

As to the technic of the operation itself, I firmly believe the McBurney incision should be universally adopted. The only exception would be the interval appendix with pelvic or gall-bladder and stomach pathology. Occasionally, one sees a very definitely localized appendicitis outside the right lower quadrant. These cases are probably best approached with a short incision directly down over the maximum point of tenderness. In the case of the very acute or perforated appendix, I believe one should always approach these through a short McBurney's incision.

One commonly hears that through a McBurney's incision it is more difficult to handle bound down, retrocecal appendices. To my way of thinking, that is exactly where McBurney's incision serves its greatest purpose, because in dealing with any retrocecal appendix the simplest procedure is to roll the cecum medially and use an entirely lateral type of approach. On these cases, therefore, the more lateral the incision is the easier is the operation and I have repeatedly found this to be true in all forms of retrocecal appendices and even in retroperitoneal types. In removing the appendix I believe the simpler a technique one employs the better. We are now simply, with one full loop, ligating the entire meso-appendix with one tie; then ligating and cauterizing the stump. I have given up the purse string suture entirely and I believe it is only a possible source of trouble.

Moreover, with the relaxation secured from spinal anesthesia, we have always been able to explore the pelvis and with relatively little difficulty operate on the right side of the pelvis. On the whole, however, when handling a very acute appendix the less exploring and the less additional operating, the better.

In the twenty-one cases of ruptured appendicitis in this series we have employed a technic that, although it is not very new, nor is it original with me, I believe is life saving. In all cases where we encounter a perforated appendix and it is possible to remove the appendix we insert a large catheter into the old appendix stump directly into the cecum and with silk ligate the stump about the catheter. The catheter is then brought out through a stab wound laterally and below the incision. The wound is left quite open. Penrose drains are inserted down to the old appendix bed and the wound is loosely packed open with iodoform gauze. Postoperatively, the catheter is allowed to drain into a bottle and a half-ounce of normal saline is injected into the catheter every two hours to keep the tube patent. We have not had to resort to nasal suction in these cases with one exception. This patient developed a postoperative obstruction proximal to the cecostomy and had to be re-operated upon. The postoperative course of these cases is remarkably smooth and has to be observed to be appreciated. The abdomen is always flat, the patient is allowed to drink water soon after the operation, and has no gas pains and no abdominal distention. In twenty-four hours the iodoform gauze is removed and in three days all drains are removed. In seven days the adhesive tape fixing the catheter to the side is removed and the catheter is allowed to loosen on its own accord. Generally by the following day (eighth) it can be removed. I have often been asked about a resultant fecal fistula. The stab wound through which the catheter is brought to the outside is of course just large enough for the purpose and in every case within 24 hours after removal of the catheter this opening is closed and we see no more fecal drainage. Theoretically, one should be able to accomplish the same end result with continuous suction, especially by the use of a Miller Abbott type tube, but the insertion of this catheter is such a simple thing, its action is so positive and the patient is so much more comfortable, that I cannot understand why it is not more universally adopted. The advantages of bowel decompression, particularly in the area of greatest involvment, can easily be understood. A decompression in this area will decompress the entire intestine and that, too, has been clinically proven. Even toxicity is somewhat lessened with facilitation of elimination and decompression.

Because of the advantages of doing an appendecostomy, or a cecostomy, whichever one pre-

fers to call it, I think one should make it a point to remove every appendix in operating on a ruptured appendix. The only exceptions we have allowed ourselves are those cases where, in a well walled-off abscess, the appendix and the meso-appendix form a part of the abscess wall. In those instances the removal of an appendix is bad surgery and defeats every effort of nature. I believe these abscesses should be well drained.

The controversy still exists as to when to operate on a ruptured appendix. Dr. A. J. Ochsner himself soon realized, after he published his paper describing his method of treatment of appendicitis, that there could be no generalities made. It is simply foolish to attempt to "splint the bowels" in a case that has been thoroughly agitated with large doses of laxatives. Also there are the cases one sees where instead of the usual constipation, the patient presents a history of marked diarrhea. I believe the sooner one operates upon these people with removal of the appendix followed by an appendecostomy, the better. On the other hand, there are the patients showing a severe toxic picture, high fever, a definite spreading peritonitis with either the early, board-like or the later, distended abdomen. These patients certainly should be treated conservatively until localization has occurred. It is not always possible to absolutely establish clinically the certainty of perforation. I believe where any doubt exists, operation should be performed regardless of the length of time the attack has existed. Occasionally, after a few hours' rest with morphine and intravenous fluids, an abdomen that at first appeared typically like an early peritonitis will show a localization entirely in the right lower quadrant and operation done immediately will save the patient the risk of a peritonitis.

I have not attempted to elaborate on statistics in this series. It is sufficient to say that in 198 successive appendectomies the appendix was removed because of disease without a fatality. This series excludes those cases in which routine appendectomies were done along with some other operation.

In the twenty-one cases of perforated appendicitis, there were sixteen instances of generalized peritonitis and five in which the peritonitis was localized. In twelve of those cases ether was used and in nine spinal anesthesia. In thirteen cases an appendecostomy was done and in five the abdomen was closed without drainage. In one case the abdomen was drained without an appendecostomy and in two cases the appendix was not removed. One of the two cases happened to be a little girl in very critical condition with a severe pneumonia.

Of the twenty-one patients with perforation there were four who developed complications. One patient, a fifteen-month-old infant, died of toxemia within eight hours after operation, the only death in this entire series. One patient developed a postoperative obstruction and had to be re-opened. We almost lost this patient. Another patient developed a fecal fistula from the drain wound and was in the hospital three and one-half weeks. One patient developed a hemorrhage from a previously diagnosed duodenal ulcer.

Summary

1. One hundred and ninety-eight successive appendectomies for acute and interval appendicitis were performed without any mortality.

2. Twenty-one cases of perforated appendicitis with peritonitis are reported with one death, a 4.7 per cent mortality.

3. The routine use of an appendecostomy or cecostomy is strongly urged in all cases of perforated appendicitis.

"The medical profession now represents the only important group in the United States which, while harassed from within and without, has shown no slightest signs of capitulation or even of retreat.

"On the basis of this fact, it has automatically placed itself in the position of an intellectual leadership of those individuals, groups and institutions which seek to preserve the important elements of individual freedom and initiative and the principle of 'Free Enterprise.'

"If we live up to this opportunity and the serious responsibility it entails, the physicians of this country can—while preserving the independence of American Medicine—most importantly and vitally serve their country during its period of crisis and greatest stress." —Dr. Edward H. Cary, President National Physician's Committee for Extension of Medical Science.

CASE REPORTS

CLINICAL-PATHOLOGICAL CONFERENCE

Presentation of a Case

MINNEAPOLIS GENERAL HOSPITAL

Frank C. Andrus, Pathologist

History.—The case is that of a fourteen-year-old female child who was first seen in August, 1937, because of the development of enuresis. A low fluid intake and the administration of sodium chloride were advised. In June, 1940, laboratory examination revealed her hemoglobin to be 48 per cent with an erythrocyte count of 2,620,000 and a normal leukocyte count. Urinalysis showed a trace of albumin, an occasional red cell, 25 to 30 pus cells per high power field and a specific gravity of 1.011.

She was admitted to the hospital on December 29, 1940. The mother stated that the child had been quite well until approximately one year previously when she started to complain of marked weakness and anorexia. It was also noted that she drank excessive amounts of water and urinated rather frequently. On December 21, she had her first menstrual period and bled excessively. Several days prior to admission she developed marked frequency of urination, voiding every ten to fifteen minutes but passing only small amounts of urine. She complained of severe thirst and difficulty in breathing. On December 28, marked puffiness was apparent about the cheeks and eyelids. Past history was negative save for scarlet fever in 1938 and pneumonia in the winter of 1939. There had been frequent nose bleeds during the fall of 1940.

Physical examination revealed an under-developed and markedly anemic child who appeared to be acutely ill. Her respirations were Kussmaul in type and the child was in a semi-stuporous condition. She was restless and there was a tremor of her lips and hands and an increased muscle tone, bordering on rigidity. The Chvostek and Trousseau signs were negative. Dry blood was noted in the nares. The mucous membranes were very pale and dry. The lungs were negative to physical examination. A short systolic murmur was heard over the precordium. The heart rate was rapid and the blood pressure was 145/90. The liver edge was palpable two finger-breadths below the right costal margin. No other masses were felt. There was puffiness about the face but no edema of the extremities.

The blood urea nitrogen was 166.6 mg. per cent and the creatinine was 3.1 mg. per cent. The carbon dioxide combining power was 7 volumes per cent. The blood phosphorous was 8.2 mg. and the blood calcium was 7.5 mg. per cent. The plasma proteins were normal.

The patient was given 500 c.c. of sodium bicarbonate solution intraveneously and on the following day, the carbon dioxide combining power had risen to 27 volumes per cent. A flat plate of the abdomen was negative. X-rays of the long bones revealed relative decalcification. An electrocardiographic tracing was normal. Urinalysis revealed a trace of albumin, an occasional red blood cell, and a few pus cells. The hemoglobin was 44 per cent, the erythrocyte count 2,590,000, and the leukocyte count 8,300 of which 89 per cent were polymorphonuclears. The reticulocyte count was 4.1 per cent; the bleeding time 7 minutes and 17 seconds and the clotting time 6 minutes and 45 seconds; the platelet count was 210,000. Two blood cultures were negative. The patient was given a blood transfusion but her hemoglobin, instead of rising, remained at about the same level and during the last few weeks of her hospital stay, it gradually dropped so that at the time of death, her hemoglobin was only 30 per cent.

On the day following admission, her temperature rose to 103 degrees and thereafter was septic in type, varying between 96 and 103 degrees. The child's condition at no time permitted pyelographic studies. On January 9, 1941, the patient complained of pain on inspiration. Crepitant râles were heard in the right lower lung field and a pleurisy or an early pneumonia was suspected. The systolic murmur which had previously been heard was louder and somewhat harsher in character. On January 15 urinalysis revealed 60 to 80 pus cells per high power field with 6 to 8 red blood cells and, on January 19, 1941, a non-fluctuant swelling was noted in the region of the left parotid gland. Several days later, swelling appeared over the parotid region on the right side also. Pus exuded from the left external auditory canal. Subsequently, the right ear also drained pus. At no time during her hospital stay did her condition show any noteworthy improvement. She ran steadily downhill and expired on January 31, 1941.

Clinical Diagnoses: (1) Hypoplastic kidneys; (2) uremia; (3) bronchopneumonia.

Autopsy.—The body is that of a rather slightly developed and poorly nourished white girl measuring 138 cm. in length and weighing an estimated 68 pounds. There is bilateral swelling in the region of the parotid glands. A fluctuant abscess is present behind the left ear. Draining sinuses are present in the region of the lateral aspect of the left thigh, over the left hip laterally, and in the right inguinal region. A decubital ulcer is present over the sacrum.

The peritoneal cavity shows no abnormalities. The right pleural cavity contains approximately 1,000 c.c. of turbid fluid. At the base of the right lung, an encapsulated empyema pocket is found containing approximately 50 c.c. of thick, green pus. The left pleural cavity contains 600 c.c. of clear, serous fluid. The pericardial sac is normal.

The heart is normal save for a soft vegetation 8 mm. in diameter on the auricular surface of the mitral valve. Scattered throughout all lobes of the right lung, there are numerous abscesses varying in size from 2 mm. to 1.5 cm. in diameter. Patches of bronchopneumonia are also scattered throughout this lung. The left lung shows bronchopneumonia but no abscesses.

The spleen is negative. The liver appears somewhat fatty. The gastro-intestinal tract is normal throughout.

The right kidney weighs 40 grams and the left 70 grams. The capsules strip with moderate difficulty tearing with them small pieces of renal parenchyma. Both kidneys contain numerous cysts varying in size from several millimeters to three centimeters in diameter. Numerous cysts contain thick, greenish-yellow pus. Very little kidney substance remains. The urinary bladder and genital organs appear normal.

The parathyroid glands appear to be definitely enlarged. The abscess behind the left ear is found to communicate with the mastoid cells on that side and from there with the middle ear. Smears of this pus reveal gram positive cocci in clusters.

Anatomic Diagnoses: (1) Congenital polycystic kidneys; (2) pyelonephritis; (3) pyemia; (4) acute bacterial endocarditis; (5) pulmonary abscesses, right; (6) bilateral confluent bronchopneumonia; (7) Bezold's abscess, left; (8) parotitis, bilateral; (9) empyema, right.

Discussion

Dr. Milton M. Hurwitz: Congenital polycystic kidneys are seen once in every three to five thousand hospital admissions. One-third of individuals with polycystic kidneys are stillborn or die within the first month of life. If they survive this period, death rarely occurs before the age of twenty years. Most go on to death in the fourth or fifth decades. One explanation of the rarity of the symptoms under the age of twenty years is that in the young patient, the remaining islands of renal parenchyma undergo compensatory hypertrophy to carry out the work of that part of the parenchyma which has been destroyed, whereas, in older patients, this property of compensatory hypertrophy is lost. Approximately the same number of males as females are afflicted with the disease.

The clinical course may be gradual or acute, the chronic form being more common. Death may be due to renal insufficiency, this being the most common cause. If renal infection supervenes, the infection may cause death. These patients, because of their anemia and general debilitated condition, seem to be more prone to intercurrent infections. Hypertension is associated with this condition in more than half of the cases.

Pain is an outstanding symptom. It is located usually in the lumbar region or flank. It is usually dull and aching in character and quite constant. It is probably due to the pressure resulting from the enlargement of the cysts. If hemorrhage occurs into a cyst which communicates with the renal pelvis, renal colic may result due to the passage of blood clots down the ureter. General symptoms are due to uremia or infection. Half of the patients have anemia. An enlarged kidney is palpable in over 95 per cent of the cases; in 75 per cent of the cases, enlarged kidneys are felt bilaterally. Gross hematuria is an early symptom in one-third of the cases. This is intermittent in type. Retinal changes may be found in those who develop hypertension. The urine usually contains some albumin, leukocytes and erythrocytes. Erythrocytes are present microscopically in about 45 per cent of the cases.

The kidneys retain their shape regardless of whether they are small or large. In the great majority of cases, the kidneys are definitely enlarged. In one patient seen at the Mayo Clinic, kidneys weighing 17 pounds each were discovered. The contents of these cysts is usually watery in consistency. Occasionally, it is colloidal in character and if infection has supervened, pus is found within the cysts. The color of the fluid is usually light yellow but may be brown, red, or black, depending upon the amount of blood mixed with the contents of the cyst. Some of the cysts are found to communicate with the renal pelvis; others are isolated. Associated anomalies in the form of liver or pancreatic cysts are found fairly frequently. The number of functioning nephrons is markedly reduced, only occasional islands of parenchyma persisting.

The hereditary aspects of polycystic kidneys are well recognized. Cairns reported ten cases in forty-two members of a family over a period of three generations. Fuller found a family of twenty-seven members over a period of four generations that had nine members afflicted with this disease. Sprent found five syblings affected. The tendency appears to be a dominant one.

Medical treatment consists of diet, treatment of uremia, when it occurs, and urinary antiseptics when indicated. Surgical treatment consists of incision of the cysts to relieve pressure or to stop hemorrhage or nephrectomy. The latter is recommended by Walters and Braasch only when there are definite indications for this procedure, such as a massive infection with pyonephrosis, calculus, renal neoplasm, or tuberculosis. Such a procedure should never be done if the function of the remaining kidney is not found to be within normal limits.

Dr. Frank C. Andrus: This is an unusual type of hereditary or familial disease of the kidneys which points out a good deal in renal physiology. As the cysts increase in size, or as infection supervenes, we have the development of renal insufficiency or sepsis; in this instance, both. The effect of the growing cysts is about the same as if you were to remove three-fourths of the patient's kidney tissue. It is the quantitative reduction in the number of functioning nephrons which accounts for the polynuria, inability to concentrate urine, and renal failure.

Dr. George Fahr: This child developed enuresis late in childhood, at eleven years of age. Now, when a child develops enuresis at eleven years, you look for something very simple. You don't just call it enuresis. What the child had was polyuria. Being a child she would sleep through the micturition period. She had just what you find in the stage of chronic renal insufficiency when the patient is approaching uremia. The first thing that you should do is to take a careful check of the specific gravity of the urine. If you see such a patient in the right state, you also practically always find hypertension. In the early stages, the urine may show a little albumin in a catherized specimen. You don't find white blood cells or red blood cells un-

less they have sudden hemorrhages. This is a paroxysmal thing. Later in the disease pyelonephritis may develop and then the urine will contain albumin. This child had little albumin and very few white blood cells at first. Then you notice that something happened; she ran a fever, rising leukocytosis, and now pus cells were seen in the urine. About the same time she got the parotitis and her pleurisy symptoms that later turned out to be empyema. I think that the pyemia originated from infection of these cysts.

ACUTE PORPHYRIA

W. H. FORD, M.D., and H. L. ULRICH, M.D.
Minneapolis, Minnesota

PORPHYRIA is not an extremely rare disease, but the diagnosis may be missed even after careful study and autopsy. Three cases of porphyria have been found in Minneapolis in the last five months. The diagnosis in our case was made only because of the red urine, which showed the typical spectroscopic bands of porphyrin. Spectroscopic examination was made by Dr. C. J. Watson at the University Hospital.*

Family history and past history were irrelevant except for three attacks similar to the illness described below.

The symptoms were abdominal cramps, nausea, vomiting, constipation, oliguria, pain in the back, legs, feet, arms, and hands, weight loss, muscular weakness, dyspnea, and difficulty in swallowing. The illness lasted about two months, and the patient died a respiratory death.

Physical examination showed a well-developed, poorly nourished, lethargic, white female with normal temperature, rapid pulse, and a blood pressure of 135/100. There was some drooping of the right eyelid, and a purulent nasal discharge. The shoulder girdle muscles showed marked atrophy and almost complete paralysis. The heart sounds were normal. There were a few râles in the chest. The abdomen was slightly tender. The patellar reflexes were absent. The abdominal reflexes were present.

Radiographs of the lumbar spine, pelvis, chest, head, and neck were negative.

The urine was red; specific gravity 1.012, acid reaction, very faint trace of albumin, faint trace of sugar, very occasional hyaline cast and granular casts, occasional epithelial cell, and a few red blood cells and white blood cells. Spectroscopic examination of the urine showed porphyrin.

The hemoglobin was 72 per cent; the red blood cell count 3,640,000. The white blood cell count, differential count, Kline test, blood calcium, blood phosphorous, basal metabolic rate, and spinal fluid were normal. The stool specimen showed pus and mucus. The blood urea was 80 mgm. and blood urea nitrogen 37.38 mgm.

The post-mortem study of the body, the brain, sections of the spinal cord, and the peripheral nerves was essentially negative.

Jan Waldenström[1] has reviewed the chemical and clinical studies of one hundred cases of porphyria. The clinical manifestations exhibit themselves in abdominal symptoms, particularly in colic and obstipation, changes in the blood, hypertension, disturbances of liver, kidney and metabolism, also marked nervous symptoms.

He grouped them as follows:

1. Congenital porphria (Günther's disease). These patients have porphyria in the urine as infants and their skin is sensitive to light. In many cases the disease is familial (recessive type).

2. Cutaneous porphyria (tarda). These cases occur later in life. There is porphyria in the urine. They are sensitive to light and there is a tendency to sclerodermatous changes. They have colicky symptoms. Uroporphyrin i'i'i' is found in the urine.

3. Porphyria acuta; with variable symptoms.
   (a) Latent type, with no symptoms. Found in members of families in which acute porphyria occurs.
   (b) Pure abdominal forms.
   (c) Pure nervous forms; very frequently they have abdominal symptoms.
   (d) Classical porphyria; with colic and paraplegias.
   (e) Comatose types; in which the terminal event is a coma. It begins with abdominal symptoms. There are no paraplegias.

4. The toxic paraplegias. These are not easily classified. Since they are not to be differentiated from the idiopathic, this group should be abandoned.

The condition must be differentiated from neuroses, psychoses, encephalitis, multiple neuritis, Landry's paralysis, periarteritis nodosum. The commonest confusion occurs in acute abdominal symptoms, particularly where there is pain, fever, constipation, vomiting and leukocytosis. In all acute abdominal symptoms, and in cases which present puzzling neurological data, think of porphyria. He records twenty-nine patients undergoing abdominal operation, the mistaken diagnosis being appendicitis in sixteen, ileus in seven, pelvic conditions in four, choleocystitis in two. Gastric or duodenal ulcers have also been erroneously diagnosed. He has never been able to find porphyrin in any other disease.

The therapy which is more or less futile consists of diuretics, alkalies, intravenous morphia or papaverine, calcium and heat. Sedatives, particularly bromides, should be avoided.

The prognosis: In full blown cases, 80 per cent are fatel. The recurrent abdominal type is much less dangerous.

Of his one hundred cases, twenty died within one year from the appearance of the symptoms of the disease. Only two lived eight years. Of twelve known living cases, one has gone on for twenty-seven years.

*The detailed description of the porphyrins encountered in the urine of this patient will be included by Dr. Watson in a separate report.

Reference

1. Waldenstrom, Jan: Studies in porphyria. Acta Medica Scandinavica, Supplement 82, Volume 92, 1937.

HISTORY OF MEDICINE IN BROWN COUNTY

Compiled by George B. Weiser, M.D.

(Continued from March issue.)

Physicians at Sleepy Eye

Dr. W. Town practiced in Sleepy Eye in 1873 and 1874. He ran a drug store for a time.

Dr. J. W. B. Wellcome, whose biography appears under the head New Ulm Physicians, practised in Sleepy Eye for a time.

Dr. Fred Wellcome studied medicine under the supervision of his father, Dr. J. W. B. Wellcome, and opened an office in Springfield in 1874. He later gave up the practice of medicine and engaged in the real estate and banking business in Minneapolis.

Dr. T. M. Marcellus, born in Canada, in 1852, came to the United States in 1866 and resided at Northfield, Minnesota, twelve years. He was a student at Carleton College, then went to the University of Michigan, where he graduated from the Medical School in 1878.

He located at Sleepy Eye where he practiced several years, then moved to Overton, or Charlottsville, Albermarle County, Virginia, in 1895. He died in 1908.

Dr. Harper M. Workman, born in Circleville, Ohio, 1858, graduated from the University of Chicago Medical School in 1880. He located at Sleepy Eye about 1880, having been sent there by the chief surgeon of the Chicago & Northwestern Railway, as surgeon for the construction gang. When the railroad was being built to Pierre, South Dakota, the division point was moved to Tracy in 1882, where he established his practice. He continued practicing his profession until his death, October 8, 1936.

Dr. Workman was first president of the village council of Tracy. He was a member of the Tracy School Board for twenty years; was president of the Council of the Minnesota State Medical Association for twenty years, to the time of his death, October 8, 1936, and was past president of the Association.

Dr. Workman took an active interest in his county and state societies; in both he was an indefatigable worker and a faithful servant.

Dr. Novious came from Sauk Center to Sleepy Eye in 1887. He was a partner of a Dr. Von Eschen.

Dr. A. P. Poaps, born in Montreal, Canada, in 1859, entered Kingston College of Physicians in 1877, then went to Bellevue Hospital Medical College, graduating in the spring of 1881. He located at Sleepy Eye in August, 1881, practiced there a brief period of time, and then moved to Los Angeles, California.

Dr. H. Wechsler practiced in Sleepy Eye in 1885.

Dr. Jacob B. Wellcome, Jr., son of Dr. J. W. B. Wellcome, graduated from St. Louis College of Physicians in 1890. He commenced the practice of medicine in Sleepy Eye the same year and continued there until the time of his death, January 3, 1935. He served as mayor and was local surgeon for the Chicago & Northwestern Railway.

Dr. James McPeek, graduate of Keokuk Iowa Medical School, 1889, practiced at Sleepy Eye for a brief period.

Dr. A. Franklin Strickler, whose biographic sketch appears under New Ulm physicians, located at Sleepy Eye in the year 1900.

Dr. Mary Strickler, wife of Dr. A. Franklin Strickler, was born in Dodge Center, Minnesota, in 1873. She graduated from the University of Minnesota Medical School and was associated with her husband in the practice of medicine at Sleepy Eye. After her husband's death she continued practicing until 1935, when she retired. She now resides at Medford, Oregon.

Dr. J. S. Kilbride, graduate of the University of Illinois Medical School in 1892, located at Sleepy Eye for practice of his profession. He later moved to Canby, Minnesota, thence to Worthington, where he resides at the present time. His son, Dr. E. A. Kilbride, is located at Worthington where he is engaged in the practice of medicine.

Dr. Ernst O. Pucklitsch, a graduate of Miami Medical College, Ohio, located in Sleepy Eye in 1894. He practiced there until 1898, when he moved to Cincinnati, Ohio, his former home. He was a member of the Brown County Medical Society.

Dr. N. C. Davis, a graduate of the College of Physicians and Surgeons, Keokuk, Iowa, practiced in Sleepy Eye in 1896. After one year he moved to Pipestone, Minnesota, where he had previously practiced for five years.

Dr. M. A. Kiefer, born at Beaver Falls, Minnesota, March 29, 1878, graduated from the University of Minnesota Medical School in 1904. He located at Sleepy Eye where he continued the practice of medicine until his death in 1931.

Dr. Gottfried Schmidt, born in Minnesota in 1871, graduated from the Minnesota Homeopathic Medical School in 1903 and located in New Ulm the same year. He moved to Sleepy Eye and engaged in practice there for several years, then moved to Lake City, Minnesota, where he continued practicing medicine until 1940. The State Board of Medical Examiners suspended his license for a period of five years for irregular practice.

Dr. A. P. Goblirsch, graduate of the University of Minnesota Medical School, 1925, served his internship at Ancker Hospital, Saint Paul, and one year of postgraduate work at Ancker Hospital.

In August, 1926, he located in Sleepy Eye where he has been engaged in the practice of medicine to the present time (1940).

Dr. William O. McLane and **Dr. Evelyn McLane,** both graduates of the Medical Department of the University of Minnesota, located at Sleepy Eye about 1930. The latter part of 1933 they moved to Jackson, Minnesota, where they reside at the present time.

Dr. J. L. Ryan, a graduate of Marquette Medical School, 1934, formerly of Snilsberg, Wisconsin, located in Sleepy Eye in 1934. He moved to Philadelphia in the year 1939, and is now taking a course in obstetrics and gynecology at the University of Pennsylvania (1940).

Dr. C. R. Senescal located in Sleepy Eye in 1932 and has been in practice there since that time.

Dr. E. W. Wohlberg, a graduate of the University of Minnesota Medical School, located in Morgan, Minnesota, for a brief period, then moved to Sleepy Eye in 1939. He is engaged in the practice of medicine there at the present date (1940).

Physicians at Springfield

Dr. Jacob C. Rothenburg, whose biography appears under the head of New Ulm Physicians, located there before locating at Springfield. He died in 1939.

Dr. Harvey A. Hitchcock settled in Springfield, Minnesota, in 1878. He was born in Courtland County, New York, studied medicine in Janesville, Wisconsin, and attended a medical institute in Cincinnati, Ohio. He practiced in Janesville, Wisconsin, and Morristown, Minnesota, before coming to Springfield. He moved to California in 1881.

Dr. Thomas Sullivan, born September 7, 1857, was one of the early physicians of Springfield. A graduate of the University of Toronto, 1881, he first located in Sharon, Pennsylvania, then moved to Springfield in 1883. He practiced medicine at Springfield until the time of his death, November 9, 1905. He was a member of the school board for many years.

Dr. J. S. Schrader, born March 9, 1858, in the County of Niagara, New York, received his preliminary education at Clarence Academy, New York. He graduated from the Medical Department, University of Michigan, in 1885. In 1901 he spent six months in postgraduate work in Vienna, Berlin, Paris and London.

He commenced the practice of medicine in Hadley, Michigan, where he remained six months, then located at Delano, Minnesota. He practiced there for fifteen years, then moved to Springfield and formed a partnership with Dr. J. C. Rothenburg, which was dissolved in 1932. From 1932 to 1940 he practiced at Hollendale, Jordan and Marietta, Minnesota, then returned to Springfield in the early part of 1940. During his medical career he has served as a member of the Pension Board at Buffalo, Minnesota, also as a member of the State Board of Medical Examiners for several years.

Dr. Cleveland Friederichs, born October 29, 1889, at Elgin, Iowa, graduated from the New Ulm high school in 1904. He received his M.D. degree at Northwestern Medical School, then located at Springfield in the summer of 1909. He practiced there until his death, October 24, 1911.

Dr. W. G. Muessle, born in 1889, graduated from the University of Minnesota in 1913. He located at Springfield about the year 1916, and has been in continuous practice there ever since.

Dr. W. A. Meierding, a native of Brown County, Minnesota, graduated from the University of Minnesota Medical School in 1907. After graduation he became a member of the medical staff of the State Hospital, Fergus Falls, 1909-1910. He located at Buffalo, South Dakota, 1910-1911; then at Springfield, Minnesota, 1911-1917. He was a captain in the World War, 1918-1919. He located in New Ulm in 1919, and served as secretary of the Redwood-Brown Medical Society from 1920 to 1934. In 1934 he retired from the practice of medicine and moved to Norco, California, where he now resides.

Dr. Edwin John Wohlrabe, born November 16, 1899, at Truman, Minnesota. He graduated in 1925 from the University of Minnesota Medical School, and served an internship of eighteen months at Philadelphia General Hospital. His first location was in New Ulm, August, 1926. In December of that year he moved to Springfield, where has been in continuous practice ever since.

Dr. Clarence F. Wohlrabe, born December 28, 1897, at Truman, Minnesota; graduated from the Mankato high school, then entered the University of Minnesota Medical School, graduating in 1924. He finished his internship in 1925, and opened an office for the practice of medicine in Young America in December. He formed a partnership with his brother, Edwin J. Wohlrabe, at Springfield in 1926, continuing there till 1933. He then moved to Minneapolis where he practiced until 1939. He is now located at North Mankato, Minnesota.

Dr. J. Emory Frank first located in Springfield about 1935, then moved to Marshall, Minnesota.

Dr. C. B. Abbott located at Springfield, Minnesota, about the year 1930, and has been engaged in the practice of medicine there to the present date (1940).

Dr. E. R. Penk, who came to Springfield in 1937, is still engaged in the practice there.

Physicians at Comfrey

Dr. Joseph A. Prim, graduate of the University of Minnesota Medical school, 1899, located at Comfrey where he practiced for several years. He moved to Minneapolis where he resides at present, practicing medicine. He was succeeded by Dr. H. D. Herron.

Dr. H. D. Herron practiced medicine at Comfrey until 1916, when he was succeeded by Dr. Arthur W. Eckstein.

Dr. Arthur W. Eckstein was born in New Ulm, and graduated from the New Ulm high school in 1906. He graduated in pharmacy at the University of Minnesota in 1908; in medicine at the Northwestern Medical College, Chicago, in 1912.

He first located in St. Cloud, then moved to Holdingford, where he practiced from 1914-1916. He practiced at Comfrey from 1916 to 1928, then located in North Mankato where he resides at the present time (1940).

Dr. F. C. Gibbon, who succeeded Dr. Eckstein at Comfrey in 1928, graduated from the University of Minnesota Medical School in December, 1926, and served his internship at the Minneapolis General Hospital, 1927. He first located in Springfield but moved to Comfrey in December, 1928. He has been engaged in the practice of medicine there ever since.

Physicians at Hanska

Dr. Douglas F. Wood, a graduate of McGill University, Canada, was the earliest practicing physician at Hanska, where he remained until 1909. He was appointed by Governor Johnson as a member of the State Board of Medical Examiners. After leaving Hanska he took postgraduate work in Vienna to specialize as an aurist and oculist. He practiced his specialty in Minneapolis until his death in 1934.

Dr. S. P. Seaburg located in Hanska in 1908 and remained their four years.

Dr. Dahl, graduate of a medical school in Norway, practiced at Hanska for a brief period of time. He then moved to North Dakota.

Dr. Mathias Sundt, born in Norway December 10, 1882, graduated from the Medical School, University of Minnesota, in 1909. He located in Hanska, where he was engaged in the practice of medicine until 1920, when he moved to Minneapolis, associating himself with the Sivertsen Clinic.

Dr. E. Borgeson located in Hanska about the year 1921, then moved to Minneapolis. Graduated from the University of Minnesota in 1920.

Dr. O. F. Pederson located in Hanska about the year 1923. He practiced medicine there until 1932, when he was succeeded by Dr. W. Donald Graham.

Dr. E. G. Olmanson, graduate of the Northwestern Medical School, located in Hanska for a brief period, then moved to Saint Peter, Minnesota.

Dr. H. Mortensbak, graduate of the University of Minnesota Medical School, 1934, located in Hanska and is practicing medicine there at the present time (1940).

(To be continued in May issue.)

FREEDOM TO THINK

We all pass through a stage of thinking that our generation in its day was a little wiser than the one that followed it. In this we are doubtless very often wrong, but I believe that my generation of medical students was more alive to the uses and interests and educational value of the debating and scientific criticism than the generation that came between the two great wars. Make every use of your opportunities here. Learn to speak in public and test for yourselves the mental stimulus of logical dispute.

You cannot afford to school yourselves in science alone. You must know something of men and movements, too. You must qualify for citizenship as well as for your baccalaureate or doctorate in medicine. Whatever form our future state may take the doctor will always be a key man in its organization. He must earn his freedom to think and to advise and must seek by every means in his power to become, like Grenfell of Labrador, like Balzac's "Country Doctor," like many a good physician who dies unsung after an arduous life devoted to the community, a man of ideals, a man of judgment and a man of action.—JOHN A. RYLE: *Cambridge University Medical Society Magazine,* Michaelmas Term, 1940.

President's Letter

NATIONAL DEFENSE

TODAY the man on the street and in the office, the worker in industry and the worker on the farm, the professional man and the merchant, all talk the same language and about the same thing—National Defense.

Those of us who had a part in the first World War know how intimately each one was gradually drawn into the maelstrom and how each family in the land was affected one way or another at some time during those trying yeârs.

That the men of medicine are doing their share without fear or favor this time as in the past goes without saying. The national emergency overshadows any feeling of personal loss or gain. We are conscientiously producing, through our culling by examinations of selectees, volunteers and National Guard, as fine a manpower for the Army as can be found in any country. Serving without pay as local draft board examiners, members of Medical Advisory Boards and draft appeal boards, we are spending our time as well as our money to further the cause. In induction centers we find men working for small pay, $15.00 a day, who, if they spent the same amount of time in their private offices, would be compensated many times more for this time. They are doing their part.

About two hundred of the Medical Reserve Corps in our state have already been called for active service. A hundred and fifty more will be in active work in camps and elsewhere by this coming summer while those who are members of the National Guard are already called to duty. These men have, in most instances, left active practices. They have not been found wanting.

Many Departmental Advisory Committees are either headed out by or have physicians as active members on them. The American Medical Association, through its activities, has correlated various departments and is coöperating closely with the War Department.

In all these and many more ways the medical personnel of the country is playing a very important part in the emergency. When history is written in the future, it will, I am sure, show in good light the unselfish attitude of the medical profession.

Each of us should be proud to be a part of this history-making, doing our share to help establish again on an even keel, world economy. It cannot be said now nor will it ever be said of us that we were dilatory in the help which we have given to our government.

B. J. Branton, M.D., *President,*
Minnesota State Medical Association.

Editorial

MINNESOTA MEDICINE

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BUSINESS MANAGER
J. R. Bruce

Volume 24 APRIL, 1941 Number 4

CLINICAL-PATHOLOGICAL CONFERENCE

IT was the abundance of autopsy material that made Vienna the Mecca for years of the physicians in this country. Known by the Germans as "Die Erklarung," the autopsy answered many a question which had puzzled the clinician. The autopsy is just as important today as it ever was and the recognition of this fact by the profession and the laity alike has accounted for the high medical attainment achieved in this country. It is a number of years since the profession in this country has needed to go abroad for medical study.

The most valuable meetings which the physician located in the large centers attends today are the clinical-pathological conferences. Here the clinical findings are correlated with those found at autopsies and the opportunity is afforded to present every phase of the disease encountered. This fact is not as generally recognized as is should be.

In order that our readers not located in the larger centers of population may share to some degree the benefits derived from such a conference, we are planning to publish again each month a report of at least one case presented at one of the conferences held in the Twin Cities, this time from that held at the Minneapolis General Hospital. The editor would appreciate an expression of the reaction of our readers to the publication of this report. In this way only can we determine whether its continuation is worth the effort.

FOURTH OF JULY INJURIES

WHY mention the Fourth of July in April? Because the subject of Fourth of July injuries is suitable for discussion any day in the year. Perhaps July 4 comes so far in advance of the term of the legislature that everyone has forgotten the injuries from the previous Fourth of July and no one remembers to submit a bill for statewide prohibition of fireworks. We sometimes pass our laws if and when we think about them.

Minnesota should have a state law prohibiting sale and possession of fireworks except for authorized public celebrations. We shall have the law in our state when public opinion demands it. There is evidence throughout the country that public opinion is predominantly in favor of eliminating the needless injuries—some of them fatal—which follow Fourth of July accidents. It only remains for public opinion to make its demand sufficiently felt. What is more fitting than that the medical profession should start the movement to obtain this beneficial legislation in Minnesota.

Here are some of the facts. Injuries from Fourth of July accidents constituted enough of a problem at the turn of the century so that the

Journal of the American Medical Association made yearly summaries of the number and nature of these accidents from 1903 until 1916. The reduction in injuries became so marked that the tabulation was discontinued. In recent years these injuries have been on the increase, several thousand being reported each year, this representing probably only a small percentage of the total number. The tabulation by the American Medical Association has, therefore, been resumed.

In 1937, there were twenty deaths reported due to burns and explosions incident to Fourth of July celebrations. In 1938, the number was eighteen and in 1939 it showed a reduction to thirteen. This was due to the improvement in the figures reported in Pennsylvania. In 1938, Pennsylvania reported 1,702 Fourth of July injuries and headed the states with six deaths. A state law barring fireworks in Pennsylvania became effective in 1939 and injuries were reduced to 85, and no deaths were reported. This is an outstanding example of the effect of such a state law.

Other figures could be given to show the salutory effect of laws and ordinances outlawing fireworks. In Saint Louis, injuries were reduced from 195 in 1938 to 76 in 1939 by such an ordinance. A perusal of the number of injuries reported from Iowa, Wisconsin, Michigan, and New Jersey, which states are numbered among the nine having prohibitive legislation, shows lower figures in these states than in Minnesota, in spite of prohibitive ordinances in the Twin Cities. Both Minneapolis and Saint Paul have ordinances prohibiting the sale or possession of fireworks within the city limits. For ten days preceding the Fourth of July each year the boundaries of both cities are demarcated by our country's flag flying from a road-side counter selling fireworks. The inconvenience of making a trip to the outskirts of the city doubtless lessens the possession of fireworks and consequent accidents within the city limits, but how ridiculous the situation.

Public opinion within a Minnesota city sufficient to support a city ordinance of this sort is indicative of general public opinion throughout the state and, of course, widespread public approval of such a prohibitive law is essential in order to expect satisfactory enforcement. Local prohibitive ordinances in the Twin Cities have doubtless kept the state as a whole from presenting too grim a picture. Although no deaths have been reported in Minnesota following these seasonal accidents during the years 1937, 1938, and 1939, it is impossible to say how many have been prevented by injections of lock-jaw serum. The report of 146 burns and lacerations, one case of loss of vision, three additional eye injuries, and one lost member from Fourth of July celebrations in 1939 suggests a much larger total number of accidents throughout the state.

Many elements in society should be willing to join forces, as is being done now in Massachusetts, in obtaining legislation to ban fireworks throughout the state, except for properly supervised public exhibitions. Societies for the prevention of blindness, municipal authorities, fire chiefs, physicians and particularly all parents should be only too willing to support legislation to eliminate that dread of accident which has ever been an accompaniment of the Fourth of July.

CHARLES WARDELL STILES

TO many people, especially those who are not physicians, the news of the death of Dr. Charles Wardell Stiles on January 24, 1941, will mean nothing, for his name was never published in the daily press and he was never awarded any distinction that would have placed him even momentarily in the limelight. He was just one of the host of scientific workers who plod away at their appointed tasks, caring nothing for public acclaim and not raising as much as a finger for notoriety.

He was one of our most distinguished helminthologists. It was his pioneer work in hookworm disease that laid the scientific basis for the splendid public health program which has gone so far in the eradication of that baleful condition. His original contribution under the modest title of Report on Hookworm Disease (Uncinariasis) in the United States in 1903 first brought the subject to attention. The facts he presented attracted the attention of the Rockefeller Foundation and he served as scientific secretary to the Rockefeller Commission for the Eradication of Hookworm Disease from 1909 to 1914. The South owes him a tremendous debt.

While his work was closely tied into that of clinical medicine he never took a medical course.

After two years in Wesleyan University he spent four years in Paris, Berlin and Leipzig, receiving his A.M., Ph.D., from the University of Leipzig in 1890. His chief connection thereafter was with the United States Public Health Service. He taught medical zoölogy for forty years in Johns Hopkins, was U. S. delegate to the International Zoölogical Congresses for a number of years and served as secretary, from 1898 to 1936, to the International Commission on Zoölogical Nomenclature. He was a voluminous writer, almost exclusively on parasitic diseases, and was a member of many American and foreign scientific associations. His death is a severe loss to scientific medicine.

GILBERT COTTAM

AMERICAN ACADEMY OF PHYSICAL MEDICINE

The American Academy of Physical Medicine will hold its Nineteenth Annual Meeting and Scientific Medicint will hold its Nineteenth Annual Meeting and Session on April 28, 29, 30, 1941, in New York, with headquarters at the Hotel Pennsylvania, where lectures, symposia, clinical papers, motion pictures, and the exhibits will be presented. Clinics will be held at the Medical Center, New York Orthopædic Hospital, Post Graduate Hospital, and the Skin and Cancer Hospital. There will be an evening session at the Academy of Medicine Building and a banquet at the Hotel Pennsylvania.

Physical medicine in relation to general medicine and the specialties will be the underlying theme of the topics under discussion. These include new developments in electrotherapy, electro-surgery, radiation therapy, hydrology, physical education, military medicine, aviation medicine, and laboratory reports on related investigation.

The sessions are under the direction of Harold D. Corbusier, M.D., Plainfield, N. J., President; Herman A. Osgood, M.D., Boston, Secretary; Fred H. Albee, M.D., New York, Chairman of the Committee on Arrangements; William D. McFee, M.D., Boston, Chairman of the Committee on Program; William Benham Snow, M.D., New York, Chairman of the Committee on Clinics; and Franklin P. Lowry, M.D., Newton, Mass., Chairman of the Committee on Exhibits.

All members of the medical profession and those of related interests are invited to attend the scientific program. There will be no registration fee. Address inquiries to Herman A. Osgood, M.D., Secretary, 144 Commonwealth Avenue, Boston, Massachusetts.

CORRESPONDENCE

Baudette, Minnesota

To the Editor:

This may be of interest to you: I have just returned from a 19,188 mile plane trip. Leaving Fargo, N. D., December 1, I flew to Manila, Philippine Islands, to visit my father, Dr. H. E. Stafford, who has retired and now lives in Baguio, P. I. I found that he has Buerger's disease, and wanted to see him before it was too late. It was my Christmas present to him, and quite a surprise, for he did not know anything about my plans until I wired him from Guam Island. The transpacific flight was quite interesting, though I was marooned for three days on Wake Island, waiting for a couple of typhoons to get out of the way, and also, on the third day, we took off, only to return in half an hour on account of engine trouble.

The Islands are frankly quite worried about Japan. Guam is pitifully unfortified, though at Midway, considerable work is being done to fortify the island and make a plane base out of it. Similar work was just starting at Wake Island. As we see by the papers, Guam is finally getting the money for defense work. Japan, for years, has quite successfully hoodwinked the United States out of any defense program, along with our misplaced economy-spending programs of the past ten years. The Filipino is at last casting longing glances at the United States, though he still kids himself a la independence.

Incidentally, I was born out there, way back when, and this happens to be my first visit to Manila in fifteen years, and the first visit to Baguio in twenty-two years. I succeeded in taking about 700 feet of colored movies, most of which came out on top. No movies or photography with a camera can be taken while on the Pan-American Clipper—Navy regulations. And absolutely ditto no on Wake and Midway Islands. I went through the Navy hospital at Guam. They have a lot of amebic liver abscesses and tuberculosis is on the rampage. The boys are doing good work there. I met a Minnesota graduate, but cannot remember his name. Both Midway and Wake have Pan-American medicoes, good men, military field equipment, and are within twelve to thirty-six hours from a hospital by airplane (Honolulu). Wake Island, size of about thirteen blocks, has a current population of twenty-seven, no women. The boys sadly need anaphrodisiacs.

Sincerely,

February 27, 1941 CHARLES C. STAFFORD

Health and National Defense

The need of national defense reqnires a strengthening and broadening of the entire industrial health program all along the line from private industry to local, state and federal jurisdictions. In this significant period of re-armament, during which our chief defense will be our industrial skill, let us be sure that we place first on our list the health and safety of our industrial workers.—L. D. BRISTOL, M.D., Jour. A.M.A., Oct. 12, 1940.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

INSURANCE OF THE EXPENSE OF MEDICAL SERVICE*

WENDELL A. MILLIMAN

NOTE—*Mr. Wendell A. Milliman is Associate Actuary of the Equitable Life Assurance Society of the United States. This article appeared first in the 1940 Transactions of the Actuarial Society of America. It is reprinted here through the courtesy of the author and of the Actuarial Society because prepaid medical service and medical expense insurance are of great current interest to all physicians, and also because this is the first authoritative analysis by a recognized actuarial expert to come to the attention of the Committee.* —THE EDITORS.

CONSIDERABLE literature concerning the subject of "health insurance" and the cost of medical care has grown up during the past few years, indicating the increasing public interest in the problems created by the heavy and unpredictable incidence of the cost of medical care. Most of the writers on this subject have approached the problem from the standpoint of either the social economist or the physician. The typical conclusion of the social economist is that the faults of our present system of distribution of medical services can be cured only by the adoption of a program of compulsory "health insurance." The physician normally regards any proposal of compulsory "health insurance" as a threat to the very foundation of sound practice of medicine. Between these two violently opposed viewpoints has gradually developed the idea that a system of voluntary insurance of the expense of medical service can be developed without disturbing the present profession relationship between patient and physician. The importance of this viewpoint is illustrated by the fact that during 1939 Connecticut, Michigan, New York, Pennsylvania and Vermont enacted laws permitting the organization of nonprofit corporations to operate medical service plans on a prepayment basis.[1] The author does not wish to use this opportunity to quarrel with either of the extreme viewpoints, or to act as a proponent for the middle course. In this article it is hoped to survey in an objective manner some of the developments of this middle course, with particular emphasis on those aspects which appear to involve elements of insurance or with respect to which insurance experience should prove of value in indicating desirable action. Space limitations obviously prevent full discussion of all of the aspects of the many problems of public health and medical economics that are touched upon in this paper. Equally obvious is the author's lack of qualifications to discuss all of these many and varied aspects. The reader's indulgence is therefore requested if, in the process of approaching these problems from the standpoint of insurance, conclusions are reached which are at variance with those which would result from other approaches.

The recent widespread development of hospital expense insurance through the medium of nonprofit hospital associations, through group insurance policies, and through individually issued policies, has increased the interest in the voluntary insurance approach to this problem. The insurance of the expense of physician's services is apparently being developed along similar lines, i.e., by nonprofit associations, through group insurance, and through individually issued policies.

Insurance of medical expenses is not an entirely new idea in this country. Aside from the extensive benefits provided under workmen's compensation coverages, insurance companies have offered limited benefits for some time, and in recent years there has been a tendency to

*Unless otherwise indicated by the context, the term medical service is used in this article in a restricted sense to include only the services of physicians.

broaden the scope of such coverages. Personal accident and health insurance policies have for many years provided limited surgical indemnity benefits. In 1930 or 1931 several companies offered, at an extra premium, an optional additional benefit in personal accident insurance policies, consisting of a very liberal medical expense indemnity provision under which all hospital and medical expenses incurred by the policyholder in the treatment of his injuries are insured, subject only to an aggregate limit with respect to each accident, of $500 or some greater sum.[2] This benefit is quite generally offered today. Since early in 1938 many companies writing group insurance have offered a surgical insurance benefit as an optional additional benefit to be included in group hospitalization policies. Further reference to this benefit will be made later.

Besides this activity of insurance companies a considerable amount of experimentation has been undertaken by various other groups interested in the problem of providing medical service.[3] These experiments are extremely varied both in details and in basic philosophy. Several plans are briefly described below in order to illustrate the range of this variation.

The plan of the Brattleboro Memorial Hospital Association is practically unique in that it is limited to the insurance of the expenses of serious illnesses. Despite its relatively recent origin —it was organized in 1927—it is one of the pioneer organizations in this field. The association insures hospital expenses, and surgeons' fees, in excess of the sum of $30 for each illness and subject to a maximum benefit ranging from $150 to $300 for illness requiring surgery, depending upon the premium rate charged the member, and one-half such maximum if no surgery is required. The annual premium rates per individual are shown in the accompanying table.

	Maximum Benefit		
	$150	$200	$300
Adult subscribers (including husbands and wives of subscribers)	Per person $5.00	Per person $6.66	Per person $10.00
Adult dependents (other than spouse of subscriber)	3.90	5.80	7.80
Children, ages 16 to 21	5.00	5.00	5.00
Children under age 16	3.00	3.00	3.00

The association has no contracts with the surgeons who render service, but since all such service must be rendered in the Brattleboro Memorial Hospital, reasonable control over the surgeons' fees is exercised. The membership of the association is quite restricted due to the size of the community in which it operates. At April 1, 1940, there were 3,359 persons insured by the association.

Another plan which involves elements of insurance is the King County Medical Service Bureau (Seattle, Washington) which was established in May, 1933, under the sponsorship of the King County Medical Society. It offers medical, hospital and nursing service for a period not exceeding twenty-six weeks with respect to any one illness or accident, including occupational accidents. The plan permits the patient free choice of physician within the group of 450 participating physicians. The physicians are reimbursed upon a fee-for-service basis, the payment being subject to pro-rata reduction if necessary to preserve the solvency of the organization. Membership is limited to employed persons who enroll in minimum groups of six, representing at least 75 per cent of those eligible for enrollment. There are at present approximately 40,000 persons covered by the plan. The premium rates vary from $1.25 to $3.50 per month per employe, depending upon the compensation rate for the industry.

The foregoing organizations insure, to a greater or lesser extent, the cost to the individual, but do not disturb to any material extent the present, almost universal, basis of payment to the physician for the services he renders. This basis of remunerating the physician is commonly described as the fee-for-service basis. The arrangement included in the King County plan for pro-rating such fees is known as the unit disbursement system. Employment of a physician, or physicians, by a central agency on a salary basis, or payment to the physician of a fixed annual "capitation" fee for each potential patient on his "panel" are the two other methods widely used to furnish medical service at a fixed annual price to the consumer. These methods do not involve insurance in the normal sense,

although it will be seen that the physician must, within limits, bear the burden of large demands for service, or benefit from light demands for service.

The Ross-Loos Medical Group, operating in the Los Angeles area, is an outstanding example of the employment of physicians on a salary basis for the purpose of furnishing medical service to subscribers at a fixed cost. The group was organized in 1929 as a clinic to provide to employed subscribers complete medical and surgical treatment, hospitalization, and, to a limited extent, medicines and supplies. In addition it provides similar services to dependents of subscribers at substantially reduced rates. The clinic is operated as a partnership of eighteen physicians, and has a total staff of seventy-five full time physicians. There were, at December 31, 1939, 22,983 subscribers. There were in addition approximately 50,000 dependents of subscribers entitled to service at reduced rates.

The cost to employed subscribers enrolled on a group basis is $2.50 a month while the cost to subscribers enrolled on an individual basis, with direct payments of premiums, is $3.00 a month. Dependents of subscribers are entitled to services other than hospitalization at reduced charges. (A dependent is defined as one who is permanently and completely dependent upon the subscriber for support, who resides in the same house, and who is related to the subscriber by blood or marriage.) The reduced charges for dependents are $.50 for each office call, $1.00 for each residence call, and other small charges for special procedures, such as $25 for a major operation.

The employment of physicians on a panel system is illustrated by the plan of the City Central Committee of the International Workers Order of New York. Through its medical department this fraternal society has since 1930 provided medical service to members (and their families) at an annual cost of $2.70 per year for single members and $4.20 for families. A family includes husband, wife, and children under eighteen. The medical service provided is that of an annual physical examination, office and home calls of a general practitioner, and services of specialists at reduced rates. The general practitioner, or district physician, is entitled to charge minimum fees for after-hour calls, for minor surgery, and for obstetrics. The annual capitation fee paid by the Order to the district physician is $1.80 per single member, and $3.00 per family. No additional remuneration, over the fees paid directly by members, is paid to the specialists. At December 31, 1939, approximately 15,000 members were participating in the Medical Department, so that, including dependents, approximately 60,000 persons were entitled to the benefits of that department.

Numerous instances could be cited of the provision of complete medical service for a group of employes through the employment of a physician, or physicians, by the employer. Since these plans normally entail no expense to the potential patient for such medical service, they have no direct bearing upon this discussion. There are also numerous instances of provision of medical service for relief groups upon plans based upon new methods of compensating physicians for their services. These experiments have illuminated some of the administrative problems which would be involved in any community-wide voluntary plan, and reference is made in a subsequent section to some of the experience with such problems.

The various plans briefly outlined above indicate the great variation in the plans of medical expense insurance which have been proposed or adopted. As previously indicated, group insurance has been extended into this field to a limited extent. On the other hand, there are numerous other organizations actively interested in establishing comprehensive plans of insurance of medical expenses, or of otherwise distributing medical services at a fixed annual cost. Both types of approach will be discussed in this paper with particular emphasis on these latter comprehensive plans.

The interest of those seeking a workable solution to this problem is usually occasioned by some one or more of the following desires:

1. A desire to eliminate the uneven burden of the cost of medical care.

2. A desire to find a workable substitute for compulsory health insurance.

3. A desire to improve the quality of medical service.

The purpose of the present paper is to explore some of the difficulties in the application of the insurance principle to this problem. Many of these difficulties grow out of the conditions im-

posed by the last two of the above objectives. For instance, the desire to find a workable substitute for compulsory health insurance imposes the necessity of providing a benefit for the lower income groups at moderate cost without resorting to taxation and without reducing the average cost of medical service rendered to moderate and high income groups. It should be noted here that it is traditional with the medical profession to charge for medical service in proportion to the patient's ability to pay. To the extent that the physician is willing to accept smaller fees for his services from persons of smaller incomes, the idea of charging different premiums to persons of different economic circumstances does not theoretically interfere with the application of insurance principles, although it obviously does introduce new and substantial administrative difficulties.

The desire to improve the quality of medical service introduces the idea of preventive medicine in the form of periodic health examinations and early visits to the physician in the event of illness. There can be no question as to the social desirability of more widespread use of periodic health examinations. However, the very fact that the cost of health examinations does not impose an unpredictable financial burden upon the individual takes it outside of the range of insurance as such. Nevertheless, it would seem to be entirely sound to include health examinations in a plan of medical benefits on the grounds that it is a service which can be included without endangering the safety of the plan. The difficulties arising from insurance of the first few visits of a physician will be referred to later.

A fundamental characteristic of an insurable hazard is that the frequency of the happening of the event which is the subject of the insurance should be subject to prediction within reasonable limits of error. A necessary corollary is that the happening of the event must not be subject to the control of the insured individual, or that there must be a strong incentive or normal desire on the part of the insured individual to avoid the happening of the event which is the subject of the insurance. It is equally necessary that the insured event shall be susceptible of precise and easily understood definition.

If the physician is remunerated upon a fee-for-service basis, then, in a sense, both the physician and the patient are insured individuals. While theoretically the frequency of conditions *needing* medical service is not within the control of the individual, it is obvious that the frequency of conditions for which medical service is *sought* is to a very considerable extent subject to this control. The extent of this control varies inversely with the seriousness of the condition needing medical service. Once medical service has been sought with respect to a condition, the volume of service becomes largely subject to the control of the physician, although it is still subject to some control by the individual.

It is apparent that the expense of the first few visits of a physician with respect to an illness or injury is, in the above sense, an uninsurable hazard. Conversely, the inclusion of such benefits in a plan imposes the necessity of strict supervision or some other control in order to minimize, or eliminate, the financial effect of too frequent visits to the physician with respect to minor, or nonexistent, disorders. It thus appears that the event must be limited and restricted if it is to be removed from substantial control by the insured individual or the physician. These limitations and restrictions immediately present difficulties in the matter of obtaining precise and easily understood definitions. The payment of the physician on a caption basis automatically safeguards the finances of the "insurer" and obviates the necessity of such limitations and restrictions. However, if the average volume of service demanded by the patient under such a plan is substantially in excess of that contemplated in the formulation of the plan, new problems arise.

In the following section a few of the practical problems involved in formulating a comprehensive plan of medical expense insurance are discussed.

1. The growing use of x-ray for diagnostic purposes and the temptation to the physician to use such service as a substitute for his own diagnostic skill mark this type of service for special attention. It is probably the most subject, of any service, to an increase in demand if no deterrents to its unlimited use are devised.

2. Obstetrical care is obviously a benefit which is subject to the control of the individual (within certain age and sex limitations), and hence is not strictly an "insurable" hazard. The question as to whether or not a plan can safely

include obstetrical benefits is intimately related to the conditions of enrollment of subscribers. If a representative cross section of the population were included in the plan, the cost of such care would be predictable. This condition is reasonably met when a group of employes, or employes and their dependents, are enrolled, providing a minimum participation of, say 75 per cent of those eligible is required. However, subscribers enrolled on an individual basis would undoubtedly show considerable self-selection with respect to this benefit, even though careful medical selection were exercised. The effect of this selection can be postponed, and perhaps minimized, by requiring a waiting period before obstetrical benefits are available. It would also seem that with respect to those enrolled in any year this self-selection would tend to disappear within a few years after enrollment. (If a waiting period for obstetrical benefits is used, due allowance should be made for this fact in evaluating the experience of the plan, and some reserve should be maintained for the delayed cost of obstetrical benefits.)

3. In pediatric care, perhaps more than in the care of adults, it is difficult to divorce preventive from therapeutic service. The volume of preventive care in the early years of life undoubtedly has a very marked relationship to the frequency and severity of subsequent illnesses, and the need for therapeutic service. It should be noted that according to accepted standards of proper medical care the frequency of visits to the physician for preventive care is very high in infancy and decreases with advancing age. Here again, attention should be called to the previous remarks concerning the "insurable" character of health examinations.

4. Refraction of eyes for individuals with impaired vision is of a recurring and predictable nature. The comments with reference to the "insurable" character of annual health examinations apply with equal force to eye refractions.

5. Psychiatric care, treatment of tuberculosis and of alcoholic or drug addiction may require very extended service, but such service is in many instances available through public institutions at no expense to the individual. The heavy burden of the cost of such service, when obtained through a private practitioner, makes it a desirable subject for insurance. However, to the extent that adequate service is provided at public expense it would seem unnecessary to insure it. The decision with reference to inclusion, or exclusion, of the expense of medical care for these conditions need not necessarily be the same for each of them.

6. The services of a specialist for a consultation normally command a higher rate of compensation than do ordinary visits of a specialist. Any such expensive service which can be ordered by the attending physician without direct financial burden upon the patient, and without any objective criterion as to what circumstances furnish adequate justification for requiring the service, appears to strain the requirements of an insurable hazard.

7. Laboratory service may be furnished by a commercial laboratory not operated by a physician, or may be furnished by a pathologist. The pathologist is a licensed physician, and hence can perform a broader function than the lay laboratory operator, but naturally commands a higher rate of compensation. The decision as to which type of laboratory service to include would be influenced by the sponsorship of the insuring organization. An organization sponsored by physicians would naturally emphasize the professional character of laboratory service furnished by pathologists, whereas a consumers' coöperative would emphasize the lower cost of the commercial laboratory.

If the furnishing of medical care fully met the criteria of an insurable hazard, which were mentioned earlier in this article, there would not be any necessity for administrative controls. The fact is that both physician and insured can, and, do, influence the quantity of medical care rendered. Perhaps this weakness is characteristic of all types of "insurance" which involve disability, regardless of whether the benefit is indemnity for loss of time, indemnity for cost of hospital service or indemnity for cost of medical care, the difference being one of degree, not of kind. In those plans where the physician is paid an annual capitation fee this fact is of no direct financial importance to the "insurer" since the risk of fluctuation in volume of service is shifted to the physician. This system removes the incentive for the physician to render unnecessary service, and gives him an incentive for discouraging unnecessary demands for service by patients on his panel. By the same token it places great confidence in the professional conscience

of the physician to ensure the rendering of adequate service under these conditions.

When the physician is paid on a fee-for-service basis this automatic protection of the finances of the insurer is absent. It is common for organizations using this basis of compensation to include in the physicians' contracts an agreement to accept pro-rata payment of fees from the funds of the organization available for such payment, i.e., what we have termed the unit disbursement system. But obviously no such organization can continue to operate successfully if the payments to conscientious, honest physicians are substantially reduced in order to pay large amounts to those physicians who make unwarranted claims upon the common fund.

Numerous types of control have been suggested. All are based upon a continuous, or periodic, examination of the individual physician's pattern of practice. This examination may be made by an officer of the insurer, by a committee of physicians, or by purely statistical analysis. When unwarranted claims are indicated there may be merely an adjustment of those claims, or stronger disciplinary action such as cancellation of the physician's contract.

Control based solely upon separate examination of the records of individual physicians, whether by an officer of the insurer or by a committee of physicians, has proven unsatisfactory. Statistical measures of the relative frequency of treated patients, the relative average number of visits per patient, and the relative distribution of types of service have been used for several years in the administration of medical relief in Essex County, Ontario, Canada.[4]

This plan provides for distribution of per capita allowances from the Government of Ontario to the participating physicians upon a fee-for-service basis under the unit disbursement system. The fee schedule provides $2.00 for office calls, $4.00 for night home calls and $3.00 for other home calls. For each month the number of patients treated by each physician is compared with the number of "expected" patients determined from a formula fitted to the experience of the month by the method of least squares. A similar comparison is made of the number of visits by each physician, substituting in this calculation the "expected" number of patients, plus the probable error, if less than the actual number. The total of fees claimed is then adjusted if it exceeds the average fee multiplied by the allowed number of visits. Presumably, consistent excess deviations in the practice of any physician are brought up for review and possible disciplinary action.

The problem of supervising doctors, and disciplining those found to be imposing upon the insurer, is a familiar one in workmen's compensation insurance. It has been at least partially solved in New York by placing the responsibility for such supervision upon the medical profession, through the medium of a committee appointed by the state medical society, as opposed to placing that responsibility in a non-professional body such as the insurer. The experience under this law makes it appear that the medical profession does not welcome supervision by any outside authority, but is reasonably conscientious in self-discipline when the proper mechanism is available.

To the extent that the medical services covered are really insurable, these administrative controls should be unnecessary. Probably the most insurable medical services are surgical procedures, on the one hand, and medical services in treatment of injuries received in an accident, on the other hand. It is within these fields that insurance companies have found it most feasible to enter the field of insuring the cost of medical expense.

Probably the most experimental large scale entry of insurance companies into this field was the introduction on a group insurance basis, early in 1938, of a surgical insurance benefit not confined to accidents. Group surgical benefits were introduced simultaneously with an extension of group hospitalization benefits to permit inclusion of dependents, i.e., wife and children under eighteen years of age. The benefit was first limited to surgical procedures performed in a hospital, but was later liberalized so as to insure the cost of surgery performed either within or outside a hospital. The insurance is a reimbursement benefit subject to maximum amounts of reimbursement with respect to various types of operations. These maximums were fixed to roughly represent the standard minimum fees which could be expected in an average industrial community, and are those widely used at the present time by insurance companies in general. There are variations from this schedule, both as to the inclusion or exclusion of individual

items and as to the maximum amounts of indemnity payable for various operations. In addition, the benefit will be issued providing lower schedules of indemnities, all amounts being reduced proportionately.

Some companies limit the benefit to the specified operations, while others make provision for non-scheduled operations. Such provision is usually limited to cutting operations, and in some instances to cutting operations performed in a hospital. These restrictions arise from the necessity of clearly defining the insured hazard. The line of demarcation between surgical operations and other medical procedures unfortunately is not as sharply and easily defined as is commonly believed. This vagueness is illustrated by the following definition of a surgical operation included in Webster's New International Dictionary.

"A procedure on the living body, usually with instruments, especially for the purpose of restoring health or alleviating suffering."

Since the majority of conditions requiring hospitalization also require some surgery, this problem was of no great moment so long as only hospitalized operations were covered. But when procedures performed in the physician's office or the patient's home were covered, the problem of distinguishing between minor, non-cutting surgery and non-surgical procedures became important.

No adequate statistical basis was available to determine the appropriate rates either for the hospital limited surgical benefit or for the more liberal benefit currently offered. The rate for the benefit limited to hospitalized surgery was computed by one company upon the assumptions that the average surgical fee under the $150 maximum schedule would be $50, and that 75 per cent of hospital admissions, other than for child-birth, would involve surgical care. Since obstetrical care was considered as involving a surgical procedure, 100 per cent of admissions for child-birth would be involved. The following table sets forth the basic factors and the details of the calculation.

	Employed Males	Employed Females		Wives		Children under 18
		Excluding Maternity Benefits	Maternity Benefits	Excluding Maternity Benefits	Maternity Benefits	
Assumed annual rate of hospitalization (all causes)	$.07	$.105	$.035	$.14	$.100	$.07
Assumed annual rate of surgical hospitalization	.053	.079	.035	.105	.100	.053
Net annual cost, at average rate of $50 per operation	2.65	3.95	1.75	5.25	5.00	2.65
Gross annual cost—loaded 1/3 of gross	3.98	$8.55		$15.38		3.98
Monthly premium (taken to nearest 5c)	.35	.70		1.30		.35

The assumed annual rate of hospitalization (all causes) was known to overstate the current frequency of hospitalization, thus introducing an additional margin for safety.

When the benefit was liberalized to include operations performed outside a hospital the rate for male employes was increased to $.40, and the rate for female employes increased proportionately. No change was made in the rates for wives and children. In practice the rate of $.40 per month per employe is charged for all employes in a group unless more than 11 per cent of the employes are females. If more than 11 per cent of the employes are females, the premium for employes is increased by the following proportions, and the same premium rate charged for all employes regardless of sex.

Per Cent of Insurance on Females	Additional Premium as Per Cent of Minimum Rate
11% to 21%	15%
21% to 31%	25%
31% to 41%	35%
41% to 51%	45%
51% to 61%	55%
61% to 71%	65%
71% to 81%	75%
81% to 91%	85%
91% to 100%	95%

Similar adjustments are made if the percentage of colored employes is abnormal.

If children are included a premium rate per family unit is used, based upon the assumption that the average family unit, averaging families with no children with families with one or more children, includes two children ("children" meaning only unmarried children between the ages of three months and eighteen years).

Thus, in this company, a policy will be issued insuring employes and their wives with a full scale of benefits at monthly rates of $.40 (or more) per employe and $1.30 per wife, or a

policy will be issued insuring employes, wives and children, at the same rate per employe, but at a rate of $2.00 per family unit, this rate applying to the family unit containing only a wife as well as to the family unit containing a wife and twelve children. The rates are reduced proportionately if the scale of benefits is reduced.

These group surgical benefits combined with hospitalization benefits have, for groups of employes and their dependents, gone a long way towards furnishing a solution to the problem of the large and unpredictable expense of medical care, and have done so without interfering in any way with the relationship between the patient and his physician. Any extension of group insurance to cover the costs of physicians' services other than for surgical procedures would be justified only if it could be offered on a basis which would permit of economical administration and upon a basis which would be generally acceptable to the medical profession. From the considerations previously set forth, it is obvious that either (1) the benefits must be restricted in their character, or (2) if the benefits are quite liberal, there must rest with the insurance company some direct control of the medical profession, or else the company must be prepared to spend a substantial percentage of its premium income to investigate and adjust claims. The one suggestion which has appealed to the author as feasible, from a purely financial point of view, is the restriction of medical care to services performed by doctors on a company selected panel. Since such a panel would necessarily be quite restricted, any such plan might well meet with opposition from the medical profession. The author is not recommending this idea, but calls attention to it since it is an essential characteristic of the community plans subsequently described. In these community plans, since all, or substantially all, of the physicians of the community may enter the plan, the same objection by the profession does not hold.

In the foregoing section of this article an attempt has been made to indicate the broader outlines of the problem and the extent to which insurance companies have sought to solve it. Under the impetus of the recent permissive legislation in a number of states various nonprofit organizations have organized or are organizing for the purpose of providing comprehensive medical services upon some basis of fixed annual cost. Both the fee-for-service basis and the annual capitation basis are used in remunerating physicians. These plans, being organized for the express purpose of insuring the cost of medical care, or providing medical care, are far less conservative in undertaking the risks involved in entering this new field than are the established insurance companies. These organizations have an important safeguard in the fact that they have contracts directly with the physicians who render the service and hence have, to some extent, both the coöperation of the physicians and control over them. The fact that these plans are more in the nature of community enterprises than in the nature of distant impersonal corporations, is doubtless an important protective factor. Despite all of these considerations, they are embarking upon hazardous and largely uncharted waters, and it would be well to watch carefully the few landmarks we know.

Once a plan of benefits has been formulated the very practical question is presented—What will these benefits cost? The answer naturally depends upon the basis and rate of compensation of the physician, and, if a fee-for-service basis, the frequency of conditions requiring insured medical service and the average number of visits per "illness." While these last two factors are not involved if the physician is paid on a capitation basis, they give the means of estimating the physician's probable income.

The interest in this subject during the past ten or fifteen years has resulted in a number of studies which have attempted to produce relevant statistics. Despite the enormous effort that has gone into these studies there appear to be very scant data upon which the actuary would rely in calculating the cost of such benefits. Fortunately there appear to be several independent approaches which furnish a means of determining reference points from which a guess may be essayed, for no calculation of the cost of insured medical benefits at the present time can be dignified as anything more than a guess. These approaches are as follows: first, an estimate may be made of the amount which individuals now pay for medical service; second, an estimate may be made of the cost of "adequate medical care" upon the basis of a given scale of fees; and third, an estimate may be made of the average charge per individual necessary to produce a given average income per physician.

Average Expenditures for Medical Care

Several studies of the average expenditures for medical care have been made within the past ten years. The most complete study is that of the Committee on the Costs of Medical Care made by Falk, Klem and Sinai, covering the experience of 8,639 white families in twelve consecutive months in the period from 1928 to 1931.[5] This study was made by means of a continuously supervised recording of the kind, frequency and duration of illness and the charges for incident medical care. The average charges for medical care were found to vary substantially by both income group and size of community. The smallness of the data when subdivided in this manner may have produced some unreliable results, but the consistency of these results is significant. The charges for services of physicians (other than oculists), excluding such charges merged in non-itemized charges of hospitals, clinics, laboratories, et cetera, as obtained from an unpublished tabulation derived from this study were as follows:

AVERAGE CHARGE PER PERSON PER ANNUM IN FAMILIES WITH SPECIFIED INCOMES

Size of Community	Under $1200	$1200 to 2000	$2000 to 3000	$3000 to 5000	$5000 to 10,000	$10,000 & over	All Incomes
Cities of 100,000 and over	7.23	7.29	9.81	14.41	20.71	44.64	13.21
Cities of 5,000 to 100,000	4.35	6.58	9.24	11.55	25.85	47.56	10.56
Towns of less than 5,000 and rural areas	4.50	6.04	8.11	10.96	16.93	28.83	7.25

The Metropolitan Life Insurance Company made a similar continuous study of medical expenses of all types (physicians' services, hospitals, nurses, medicines, etc.) for the six months period from January to July, 1929.[6] This study included 3,281 families in industrial centers. The average cost per person for all types of care during this six months period was $13.48. Very nearly half of the total recorded expenditures were for services of physicians (other than oculists), so that the above figure might fairly be taken as representative of the annual cost for physicians' services found by this survey. This compares with the over-all average of $9.43 for such services found by the Committee on the Costs of Medical Care.

A study of income of physicians, made by the Committee on the Costs of Medical Care, indicated the following average annual per capita payment during 1929 for services of physicians in private practice.[7]

Size of Community	Average Annual Expenditures for Services
Under 5,000	$ 3.31
5,000– 9,999	11.28
10,000– 24,999	9.59
25,000– 49,999	10.85
50,000– 99,999	12.43
100,000–499,999	16.25
500,000–999,999	15.89
1,000,000–and over	16.50
Total (Continental United States)	$ 8.88

A series of studies of the spending patterns of the United States population has recently been undertaken by the National Resources Committee, the United States Bureau of Labor Statistics and the Bureau of Home Economics. These studies were made by a census procedure whereby an attempt was made to obtain at one time a comprehensive record of the expenditures, for the preceding twelve months period, of the families included in the controlled samples. This procedure must sound strange to the actuary who has spent considerable time with the problems involved in the correction of errors in population statistics resulting from intentional and unintentional misstatements of such a simple bit of information as age. With respect to the reliability of the resulting data the Bureau of Labor Statistics states:

> An investigation of family income and consumption by means of schedules filled after the end of the report year is confronted with questions concerning the degree of accuracy with which families may be expected to remember details of expenditures made over a period of twelve months. It is admittedly impossible to obtain by the schedule method precise records of expenditures for each item included in family living. It is believed, however, that accuracy sufficient for the purposes of generalization can be achieved. One means toward this end followed by the Study of Consumer Purchases was the use of highly detailed schedule forms which served to remind families of the wide variety of items for which they might have incurred expenditures during the year. Such schedules, filled through painstaking interviews, provided data that in the great majority of cases undoubtedly represented closely the spending patterns of the families interviewed.

Despite the serious question as to the reliability of such a method for the purpose of indicating the exact amount expended for any specific item, there are shown below, for what they may be worth, figures derived from this study with reference to the per capita expenditures for services of physicians in New York City.[8] Considering the difference in the dates of the studies, there is a surprising correspondence between these figures and those for cities of 100,000 and over produced by the study of the Committee on the Costs of Medical Care. It is difficult to reconcile this close agreement with the indications of substantial decline in physicians' incomes during the interval between the two studies.

AVERAGE ANNUAL PER CAPITA EXPENDITURES FOR PHYSICIANS' SERVICES, 1935-1936

(Non-Relief Native White Families in New York City)

Income Level	General Practitioner	Specialist	All Physicians
$ 500–$ 999	$ 1.99	$ .15	$ 2.14
1,000– 1,499	4.51	1.24	5.75
1,500– 1,999	6.73	2.17	8.90
2,000– 2,499	8.89	2.54	11.43
2,500– 2,999	8.68	3.12	11.80
3,000– 3,499	9.12	6.95	16.07
3,500– 3,999	10.48	5.77	16.25
4,000– 4,999	13.53	4.33	17.86
5,000– 7,499	15.73	9.94	25.67
7,500– 9,999	26.75	14.71	41.46
10,000–and over	42.07	21.03	63.10

From such data as is available it appears probable that the average per capita expenditure for physicians' services is less than $10 per year, the average increasing substantially with increase in income level, and to a lesser degree with increase in size of community. While the premium for any plan of comprehensive medical service would properly be in excess of the present average expenditure it is probable that if the difference is too great, for the same economic and community group, the benefit would be very difficult to sell and the tendency towards adverse selection would be seriously increased.

Estimates of the Cost of "Adequate" Medical Care

One of the projects of the Committee on the Costs of Medical Care was an attempt to give concrete, statistical meaning to the term "adequate" medical care.[9] In this study good medical care is defined as "the kind of medicine practiced and taught by the recognized leaders of the medical profession at a given time or period of social, cultural, and professional development in a community or population group." There is no finality in this definition, it is a dynamic concept, and it will be noted that while on the one hand "good medical care" at a given time and place is something more than the average person is receiving, since it is the kind of medicine practiced by the leaders of the profession, it may be less than "good medical care" at a later time or in another place.

A standard table of sickness rates was developed by Lee and Jones from a comprehensive review of available sickness statistics. For all acute conditions, their expectancy rates describe the number of attacks to be expected during a year in an average population group. For chronic diseases, the rates describe the number of persons who are affected during a year.

Lee and Jones grouped diseases and defects in nineteen broad categories. In each category there were selected certain "typical diseases" as illustrative of service requirements. The average amount of service for typical diseases in each such category was assumed to hold for all diseases in the category. Estimates of medical service in the prevention, diagnosis, and treatment of diseases and of physical and mental defects were obtained by Lee and Jones from physicians in general practice and in special practice in several parts of the United States.

Two estimates of the cost of adequate medical care have been published, using in each case the standards of adequacy set up by Lee and Jones. The earlier study by Bradbury accepted the Lee and Jones estimates of the incidence of illness requiring medical service and computed costs based upon the schedule of minimum fees printed in the 1933-1934 "Blue Book" of the Chicago Medical Society.[10] Upon this fee schedule the cost of "adequate medical care," including x-ray and pathology but excluding mental and nervous conditions and the cost of refractions, was estimated to be $37.50 per person per annum. The later study by the Bureau of Medical Economics of the American Medical Association[11] substituted figures as to incidence of illness compiled by the United States Public Health Service,[12] and utilized an unpublished compilation by the Bureau of Medical Economics of median minimum fees based upon the fee schedules of 559 county medical societies. This calculation produced a cost

for medical care, again exclusive of mental and nervous conditions and cost of refractions, of $15.83 per person per annum. No provision was made in this latter computation for the cost of x-ray and pathology. The resulting estimated cost of medical care is comparable with an estimate for similar services of $26.33 per person per annum in the Bradbury study.

The size of the Bradbury estimate raises serious question as to the adequacy of our existing facilities to supply such service and the ability of our present economy to pay for it. In this connection attention should be called to the comments of the Committee on the Costs of Medical Care:

> If the people of the United States were receiving the medical care which they need and which the dictates of medical art and science warrant, the army of medical practitioners would have to be larger than it is at present and existing medical agencies probably could not supply services equal in quality or volume to those which the standards [of good medical care] prescribed, and the people probably would not, and could not afford to, buy them if they could be furnished.[13]

ESTIMATES OF THE COST OF "ADEQUATE" MEDICAL CARE

(Excluding the cost of treatment of nervous and mental conditions and the cost of refractions)

Medical Care in Treatment of the Following Diseases and Conditions (Excl. of operations, laboratory and x-ray)	Average Annual Cost Per Person	
	Bureau of Medical Economics Estimate	Bradbury Estimate
Communicable diseases		
Syphilis and gonorrhea	$ .06	$ 2.10
All others	1.19	1.83
General diseases	.70	.63
Diseases of eye and ear	1.59	1.23
Diseases of circulatory system	1.19	.83
Diseases of respiratory system	2.78	6.50
Diseases of digestive system	.47	1.32
Diseases of skin and cellular tissue	.53	.27
Diseases of muscles, bones and joints	—	.26
Diseases of kidney and annexa	.49	.51
Non-venereal diseases of the G.U system	.37	.29
The puerperal state	1.26	1.32
Malformation and early infancy	.06	—
All accidents	.35	.68
All other conditions	.69	—
	$11.73	$17.77
Operations	4.10	8.56
	$15.83	$26.33
Laboratory service		5.36
X-ray service		5.81
		$37.50

The lower figure brought forth by the Bureau of Medical Economics is based upon the same standards of medical care as those used by Bradbury, and there are few substantial differences in the frequencies of illness assumed in the two studies. The results of the two studies may be brought into reasonable agreement if allowance is made for the higher incidence of venereal diseases, the greater frequency of treated diseases of the respiratory system, the higher per illness cost for treating diseases of the digestive system, and the much higher average cost per operation assumed in the Bradbury study. It should be noted that the frequency of venereal diseases included in the Bureau study is derived from data based upon voluntary statements, and hence would tend to be considerably understated. The Bureau study also made no provision for the cost of treating common colds, despite the fact that the low incidence of colds (.107 per person per annum) included in the morbidity data upon which the calculation was based would indicate that only colds of more than average severity were included in that data. A comparison of the estimates of the cost of services for the different disease categories is given in the accompanying table.

It appears from both of the foregoing studies that "adequate" medical care provided upon a fee-for-service basis at customary "minimum" fees (probably more correctly termed standard fees) would cost several times as much as the average person now pays for medical care. This large discrepancy is due to the fact that "adequate" medical care requires more service than is now rendered to the average person, and to the fact that the average collected fees for various units of service are less than the so-called "minimum" fees.

Average Income of Physicians

The evidence as to present average incomes of physicians is not very satisfactory. Studies have been made by the American Medical Association[14] and the Committee on the Costs of Medical Care[7] of the average income of physicians during the period from 1928 to 1930. These studies were based, in most instances, upon voluntary statements by physicians concerning their incomes, although in the study by the Committee on the Costs of Medical Care recourse was also had to income tax returns for 1929. As

might be expected, there is evidence in these returns of a tendency for the average income derived from the data to decrease with an increase in the percentage of questionnaires returned.

The American Medical Association study indicated incomes of physicians in private practice during 1928 as follows:

Type of Practitioner	Number in Sample	Average		Median	
		Gross	Net	Gross	Net
All practitioners.....	5,475	$10,440	$6,499	$8,090	$4,938
General practitioners	3,470	8,078	4,887	6,839	4,138
Specialists.....	2,005	14,527	8,876	11,575	7,072

The study made by the Committee on the Costs of Medical Care indicated the following incomes during 1929 for physicians in private practice.

Type of Practitioner	Number in Sample	Average		Median	
		Gross	Net	Gross	Net
All practitioners.....	6,989	$ 9,461	$5,700	$7,026	$4,100
General practitioners	3,965	6,421	3,900	5,245	2,900
Partial Specialists...	1,444	9,995	6,100	8,292	5,000
Complete Specialists.	1,580	16,304	10,000	12,239	7,500

As would naturally be supposed there was considerable variation in the indicated incomes by size of community, although the median incomes vary less than the average incomes.

No statistics are needed to know that the incomes of physicians have decreased substantially since the period of the above studies. Preliminary reports of a study by the National Bureau of Economic Research indicate that the average net incomes of physicians in private practice, including both general practioners and specialists, were in the neighborhood of $3,500 to $4,000 during the period from 1934 to 1936. It is frequently assumed that the net income represents approximately 60 per cent of the gross income, hence it may be assumed that the more recent statistics indicate an average gross income, for physicians in private practice, in the neighborhood of $6,500.

The ratio of physicians to population varies considerably from one section of the country to another. However, for practically all sections the ratio of physicians to population has shown a continuous decline during the current century. The number of physicians per 1,000 persons in the United States is given by the Committee on the Costs of Medical Care as 1.73 in 1900, 1.64 in 1910, 1.37 in 1920 and 1.26 in 1929.[13] These figures include in the number of physicians those physicians who are retired and those employed on salaries by governmental agencies, hospitals and teaching institutions. In 1929 the ratio of independent private practitioners to the population was practically one per 1,000. On the other hand, it should be noted that the population figures used above include persons in institutions and those on relief. All things considered, it would seem conservative to assume, in testing the adequacy of any rates proposed for a plan of insured benefits, a ratio in the neighborhood of one physician to 700 patients.

Several nonprofit corporations have organized, or are in the process of organization, under the provisions of the 1939 amendment of the New York insurance law permitting the formation of medical expense indemnity corporations. The New York insurance law states that "Medical expense indemnity shall consist of reimbursement for medical care provided through duly licensed physicians, for nursing service and of furnishing necessary appliances, drugs, medicines and supplies." In practice the corporations which have been organized restrict the indemnity to reimbursement for care provided by physicians. An outline of the proposed plans of two of these corporations being organized in New York City is given below. These plans are not presented as models of perfection, nor as horrible examples. It is to be hoped that a critical examination of their structure by members of this body may serve to throw light on the difficulties which may be encountered by these and similar organizations.

It should be pointed out that neither of these organizations has been quite adventurous enough to follow the pattern of the hospital service associations to the extent of proposing to offer a family coverage contract at a rate which is not in proportion, when compared with the rate for individual coverage contracts, to the increased risk involved. However, both have followed the precedent of these associations in ignoring in their premium rates the difference in incidence of volume and cost of medical service by age, sex, and marital status. In both cases an average rate is determined upon the assumption that the insured group will be no worse than a representative cross section of the population. Sales meth-

ods and underwriting procedure may well make the insured group better or worse than such a cross section.

It is obvious that a conservative estimate of the cost of medical care under an insured plan will be greater than the amount that the average person is now paying for medical care. At the same time it does not appear probable that the average person would be willing to pay the price indicated above for "adequate" medical care. It appears reasonable to assume that an insurance plan with proper safe-guards will experience a demand for service in excess of that found by the Committee on the Costs of Medical Care, i.e., an average of 2.39 physician's visits per person per year,[5] and less than that indicated by Lee and Jones as necessary for "adequate" medical care, i.e., 6.6 visits per person per year.[9]

One of the groups described below is organized as a consumers' coöperative, and while its policies are, as must necessarily be the case in any such group, the result of conference and compromise between lay people and medical people, these policies are largely the product of a lay approach. As opposed to this approach, the second plan described is sponsored by a group of physicians and its policies are largely the product of a medical approach.

In the consumers' coöperative group emphasis is placed on preventive and early therapeutic care. Medical care to be provided includes

(a) Initial and periodic physical examinations
(b) Service of general practitioner and specialists, including office, home and hospital calls, except for
  (1) pre-existing conditions
  (2) treatment of pregnancies commencing within 11 months of entrance
  (3) conditions compensable by government or under law
  (4) eye refractions
  (5) care in cases which become institutionalized
  (6) treatment of functional nervous or mental conditions
  (7) drug and alcohol addiction
(c) Laboratory and x-ray service
(d) Physiotherapy.

The general practitioner and pediatrician (who will, if desired, serve in place of the general practioner for children up to age fifteen) will be remunerated on a capitation basis, while specialists will be remunerated on a fee-for-service basis combined with a unit disbursement arrangement. Laboratory work will be handled by a commercial laboratory.

Obstetrical care is subject to an additional charge of $25, while the subscriber must pay one-third of the standard fee for x-ray service, but not in excess of $10 per year. A charge of $1 is made for the first home call by the general practitioner in treatment of each illness. Except for these extra charges, and the exclusions outlined above, the medical care to be provided is unlimited.

The premiums for this plan were computed upon the following assumptions:

(1) That the average general practitioner could handle a panel of about 1,400 patients if he handled no obstetrical or pediatric work, and should receive for such full time service, about $7,000 per year.

(2) That the average pediatrician could handle a panel of about 880 children and should receive an income for such full time service of about $8,000 per year.

(3) That the average specialist collects about 75 per cent of the standard, or prevailing fees, for the service which he renders, and that the volume of service required would be that indicated by the Lee-Jones study.

(4) That the average birth rate among insured subscribers would be 18 per 1,000 (as compared with a population birth rate of 14.26 per 1,000 in New York City during 1938), and that the cost per pregnancy is $100, of which $15 is defrayed by the additional charge. (The other $10 is assigned to cover some of the extra cost of pediatric service for children during the first year of life.)

(5) That an annual frequency of 140 x-ray procedures per 1,000 subscribers may be expected, and that the average standard fee per x-ray procedure would be $16.00, of which one-third will be paid by the patient and the balance (41.7 per cent) necessary to produce a payment of 75 per cent of standard fees, paid by the company. It should be noted that the frequency of x-ray procedures is lower than that assumed by Lee and Jones (171 per 1,000). This assumption is reminiscent of the following statement by Watson.

I have had instances repeatedly wherein a moderate reduction in the rate of sickness benefit was followed by very substantial reduction in the quantity of claims, and I have consequently become accustomed to base my estimates of the practical value of reforms upon the expectation that a reduction in the rate of benefit, in the cases in which malingering is suspected, will be accompanied by a decline in the number and duration of the claims.[15]

(6) That 1,300 laboratory procedures (exclusive of those done without cost to the company, by general practitioners, or the public health department) will be required annually per 1,000 subscribers, and that this service can be obtained from a commercial laboratory at $.27 per procedure.

These assumptions result in an estimated net annual cost as follows:

	Estimated Annual Per Capita Cost
General care (including pediatrics)	$6.00
Specialist care (other than obstetrics and x-ray diagnosis)	6.00
Obstetrics	1.53
X-ray diagnosis	1.00
Laboratory work	.35
Net Annual Premium	$14.88
Loading	3.12
Gross Annual Premium	$18.00

(Based upon estimated annual costs of $5.00 per adult and $9.10 per child, weighted 75 per cent and 25 per cent respectively.)

The uncertainty of these assumptions and the resulting estimated cost, both in the aggregate and for the various types of service, is illustrated by the fact that, after determination of the premium in the foregoing manner, provision was made to increase the annual capitation fee for general practitioners to $6.50 and for pediatricians to $10.35, reducing the provision for specialists accordingly. It will be recalled that the specialists are to be compensated under a unit disbursement plan.

Special attention is called to the fact that the uninsurable nature of early therapeutic care is recognized by the arrangement to remunerate general practitioners and pediatricians upon a capitation fee basis. The important question remains as to whether at $6.50 per year for adults and $10.35 per year per child, this plan will sufficiently compensate general practitioners and pediatricians so that physicians of proper qualifications will be attracted to the plan and be satisfied by it in operation. The evidence on both sides of this question is, to the writer's mind, inconclusive.

The proposed benefits of the second organization are in the nature of indemnification for the expense of medical service furnished by participating physicians in treatment of serious illnesses and injuries. This plan, in contrast to the one just described, does not include provision for periodic health examinations. A stipulated deductible sum with respect to each illness, varying according to the subscriber's economic status, must be paid by the subscriber to the physician before any benefits accrue. The maximum amount of indemnity which may be provided in any one year is $500, and within this maximum various amount limitations are applied to the different types of service. The rates, and limits, of indemnity are indicated by the accompanying table.

Service of	Maximum Rate of Indemnity	Limit of Indemnity During any 12 Consecutive Months
General practitioner		$300
(a) Office visit	$2.00 per visit	
(b) Home visit—daytime	3.00 per visit	
(c) Home visit—night (if service is required between 12 P.M. and 7 A.M.)	5.00 per visit	
Specialist	In accordance with schedule of fees consistent with New York State Workmen's Compensation fee schedule.	100
Surgeon		300
Surgical operation, including after care		
Pathologist		50
Radiologist		
(a) Diagnostic x-ray		100
(b) X-ray and radium therapy		300
Anesthetist		75

The exclusions under this plan are substantially the same as those in the one just described.

In determining the premium rate for this organization it was assumed,

(1) That there would be an average of 2.5 visits to general practitioners per year per person, exclusive of health examinations and obstetrical care, and that a deductible sum of $10 per illness would eliminate from the scope of the insurance one-half of the visits to the general practitioner,

(2) That the average fee per visit to general practitioners under the fee schedule adopted would be $2.50,

(3) That there would be an average of .5 visits per year per person to specialists, exclusive of

visits incident to surgical care, and exclusive of x-ray service,

(4) That the average fee per visit to specialists, after deduction of amounts paid under the deductible sum provision, would be $5,

(5) That the average annual frequency of surgical procedures would be 6.5 per 100 and the average fee per operation, in excess of any amount paid under the deductible sum provision, would be $50,

(6) That the average annual frequency of births would be 1.5 per 100 and that the average fee, in excess of amounts paid under the deductible sum provision, would be $65,

(7) That the average annual frequency of services of an anesthetist would be 5 per 100 and that the average fee would be $10,

(8) That x-ray and pathology service would cost $1.50 per year per person.

The following tabulation summarizes the calculation of the net premium.

General practitioner	
Average of 2.5 visits per year, of which one-half are excluded, @ $2.50 per visit	$ 3.13
Specialist	
Average of .5 visits per year @ $5.00 per visit	2.50
Operations	
Frequency of .065 per year @ $50 per operation	3.25
Obstetrical Care	
Frequency of .015 per year @ $65 per case	.98
Anesthetist	
Frequency of .05 @ $10 per case	.50
X-ray and pathology	1.50
Net premium	$11.86

To this net premium was added a loading of 25 per cent, producing a gross annual premium of $15.00.

The direct payment to the physician under the $10 deductible sum provision was assumed to average $6 per year per person. It will be seen that the average cost of medical care produced by this calculation is substantially in excess of present expenditures.

In an attempt to carry into this plan the traditional gradation of charges for medical care in accordance with economic status it is proposed to make provision for different premiums for persons of different income and family responsibilities. The classification adopted is shown in the accompanying table.

The premium rates for these classes were graded empirically, adopting the above rate of $15 a year for Class A, $12.60 for Class B, $10.80 for Class C and $9.00 for Class D. The

ECONOMIC STATUS—INCOME PER MONTH

Class	Married Persons and Members of Their Families	Single Persons
A	over $175	over $125
B	$140–$175	$100–$125
C	$100–$140	$ 75–$100
D	under $100	under $ 75

deductible sum was also graded from $10 for Classes A and B to $7.50 for Class C and $5.00 for Class D. The payments to physicians will be on a unit disbursement plan, the funds for each class being kept separate for this purpose. It is estimated that if the foregoing assumptions as to average amount of medical care are realized these premiums will permit payment of 100 per cent of the standard schedule fees for services to the Class A subscribers, 80 per cent of such fees for services to the Class B subscribers, 60 per cent for services to the Class C subscribers and 40 per cent for services to the Class D subscribers. Obviously different assumptions as to the average amount of medical care would change these ratios.

If the selection of subscribers is such as to produce a representative cross section of the population, and if the medical service required by the subscribers is such as to permit an average of 700 subscribers per full time physician, then these rates are apparently sufficient to provide an average gross annual income per physician in the neighborhood of $8,000, or an average net income in the neighborhood of $5,000.

The difficulty of determining the economic status of the individual, for purposes of correct determination of his class, and of making adjustments as an individual's status changes, are obvious. Some of these difficulties are minimized when the enrollment is conducted on a group basis. The claims administration procedure may also be utilized to pick up some of the unavoidable misstatements and changes in status. Only experience will tell whether the substantial difficulties which remain can be controlled by other means.

As previously stated, sound sales and underwriting procedures are vital to the success of these organizations. Both of the above organizations contemplate enrollment of subscribers under substantially group underwriting rules, with payroll deduction or its equivalent, although the

contracts to be issued will be individual contracts. However, both organizations contemplate enrollment of individual subscribers, at somewhat higher premiums, subject to satisfactory medical examination. Under the group enrollment procedure an employe might apply for coverage for himself, his wife and children, the same rate being charged for each individual covered.

While it is the writer's desire to make this article completely objective, he feels that the following generalizations with reference to the insurance of the expense of medical service are warranted:

1. Not all types of physicians' services meet the requirement, for an insurable hazard, that the happening of the event must not be subject to the control of the insured individual. The services which most nearly meet this criterion are surgical procedures and treatment of injuries received in accidents. The services which fail most completely to meet this criterion are health examinations, obstetrical care, the first few visits of a physician in treatment of an illness, and x-ray service.

2. If the physician is remunerated on a capitation fee basis, the financial effect upon the "insurer" of the non-insurable nature of early visits by physicians is eliminated. In this situation, however, the individual physician must bear the risk of providing an unpredictable amount of benefit for a fixed annual price, and hence becomes the real insurer of these services.

3. While not an insurable hazard, periodic health examinations may, in view of their predictable nature, constitute a type of service which can be incorporated in a plan of insurance without endangering the financial stability of the insurer, if proper provision is made for the cost of such examinations.

4. Obstetrical care can be safely included in a plan of insurance only if the method of enrollment of subscribers is such as to avoid, or minimize, self-selection for the purpose of taking advantage of such benefits. If such self-selection is substantially avoided, obstetrical care, although not an insurable hazard, also constitutes a type of service which can appropriately be added to a plan of insurance of medical expense.

5. Any plan which attempts to furnish comprehensive medical service must offer benefits which are, to a greater or lesser degree, not insurable risks, and hence, to prevent undue abuse of the plan, must rely upon some method of supervision of the physicians providing the service and upon the right of cancellation of individual subscribers' contracts.

6. There is an almost complete lack of statistics satisfactory for the precise determination of the cost of insured medical services. It seems highly probable that under any insured plan the rate of demand for services will be increased, and hence, ignoring administrative expenses, either the average cost of service to the public must be greater than at present or the rate of remuneration to physicians per unit of service must be less. It also seems reasonable to assume that the average cost should be less than that indicated by the existing estimates of the cost of "adequate" medical care, unless there is a substantial increase in the ratio of physicians to population.

7. A sound basis of selection of lives to be insured is fundamental to the success of any plan undertaking to insure the expense of medical services. Employed individuals enrolled on a group basis, with minimum participation requirements, are undoubtedly the best risks. The enrollment of dependents of employed individuals with similar participation requirements, and the enrollment of individuals with conservative medical examination requirements, may furnish a sound basis of selection.

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(7) The Incomes of Physicians, by Maurice Leven (1932).

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(9) The Fundamentals of Good Medical Care, by Roger I. Lee and Lewis Webster Jones (1933).

(10) The Cost of Adequate Medical Care, by Samuel Bradbury (1937).

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REGISTRATION FEES

At a recent meeting of the Minnesota State Board of Medical Examiners Dr. Max W. Alberts presented a request from Medical Reserve officers, who had been called into active service, that they be exempt from paying the annual registration fee while on duty. The board would have liked to accommodate these men, but it realized that it had no power to waive the fee since it is stipulated by law. Should the law be changed, the board would be compelled to curtail its legal activity in prosecuting quacks because the present income is scarcely enough to conduct its present active program. The board hoped that the local county medical societies would find a way to assume the registration fees for its members who are away in Army service.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

PHYSICIANS LICENSED FEBRUARY 14, 1941

January Examination

Ambrusko, John—U. of Buffalo, M.D. 1937, Mayo Clinic, Rochester, Minn.

Arnow, Leslie Earle—U. of Minn., M.B. 1940; M.D. 1940, 226 Medical Sciences, University of Minnesota, Minneapolis.

Beare, John Byron—St. Louis U., M.D. 1939, Mayo Clinic, Rochester, Minn.

Bennett, Warren Alfred—Northwestern, M.B. 1937; M.D. 1938, Mayo Clinic, Rochester, Minn.

Boosalis, Nicholas Gus—U. of Minn., M.B. 1940, St. Mary's Hospital, Duluth, Minn.

Bryson, John Chalmers—Johns Hopkins, M.D. 1938, Mayo Clinic, Rochester, Minn.

Buck, Ronald M.—Northwestern, M.B. 1938; M.D. 1939, Mayo Clinic, Rochester, Minn.

Burdon, Phyllis J.—U. of Ore., M.D. 1939, Mayo Clinic, Rochester, Minn.

Cain, James Clarence—U. of Texas, M.D. 1937, Mayo Clinic, Rochester, Minn.

Carlson, Russel Edward—U. of Minn., M.B. 1939; M.D. 1940, Eitel Hospital, Minneapolis, Minn.

Conant, Robert Falk—U. of Minn., M.B. 1940, Ancker Hospital, Saint Paul, Minn.

Dobyns, Brown McIlvaine—Johns Hopkins, M.D. 1939, Mayo Clinic, Rochester, Minn.

Dunlap, David Logan—Harvard, M.D. 1939; Mayo Clinic, Rochester, Minn.

Finlayson, Alister Ian—U. of Neb., M.D. 1937, Mayo Clinic, Rochester, Minn.

Flora, LeRoy William—U. of Minn., M.B. 1939; M.D. 1940, 2545 Grand Ave., Minneapolis, Minn.

Gast, Charlotte Marie—U. of Rochester, M.D. 1934, Medical School, University of Minnesota, Minneapolis.

Harvey, George, Jr.—Vanderbilt, M.D. 1938, Mayo Clinic, Rochester, Minn.

Hopkins, Edward Orson—Johns Hopkins, M.D. 1937, Mayo Clinic, Rochester, Minn.

Hurwitz, Milton Mayer—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis General Hospital, Minneapolis, Minn.

Jacobson, Clifford Wilton—U. of Minn., M.B. 1940, Ancker Hospital, Saint Paul, Minn.

Janes, Joseph Mowat—U. of Western Ont., M.D. 1936, Mayo Clinic, Rochester, Minn.

Jensen, Nathan Kenneth—Wash. U., Mo. M.D. 1935, University Hospital, Minneapolis, Minn.

Keeley, James Kenneth—Harvard U., M.D. 1937, Mayo Clinic, Rochester, Minn.

Kiernan, Paul Chapman—Geo. Wash. U., M.D. 1937, Mayo Clinic, Rochester, Minn.

Kreilkamp, Bernard Leo—U. of Minn., M.B. 1940, Minneapolis General Hospital, Minneapolis, Minn.

Kruzich, Stephen John—Rush Med. Col., M.D. 1940, St. Joseph's Hospital, Saint Paul, Minn.

Laikola, Leslie Alexander—U. of Minn., M.B. 1940, 627 N. Court Street, Eveleth, Minn.

Lillie, John Canfield—U. of Mich., M.D. 1939, Mayo Clinic, Rochester, Minn.

Lyon, John Dexter, Jr.—U. of Minn., M.B. 1939; M.D. 1940, 151st F. A., Camp Claibourne, La.

Manchester, Raymond Day—U. of Minn., M.B. 1940, Northwestern Hosp., Minneapolis, Minn.

Moreton, Robert Dulaney—U. of Tenn., M.D. 1938, Mayo Clinic, Rochester, Minn.

Mork, Arthur Harold—Creighton U., M.D. 1940, Ancker Hospital, Saint Paul, Minn.

Morrison, Andrew Ervine—U. of Minn., M.B. 1939; M.D. 1940, Minneapolis General Hospital, Minneapolis, Minn.

Musty, Nicholas J.—U. of Minn., M.B. 1940, 2057 Laurel Ave., Saint Paul, Minn.

Nelson, Lloyd Stanley—U. of Minn., M.B. 1940, Ancker Hospital, Saint Paul, Minn.

Otten, Fred Ross—La. State U., M.D. 1940, Ancker Hospital, Saint Paul, Minn.

Owens, William Alexander—U. of Minn., M.B. 1937; M.D. 1938, Montevideo, Minn.

Patterson, Stuart Alexander—U. of Minn., M.B. 1940, St. Mary's Hospital, Duluth, Minn.

Proudfit, Charles Hinkley—Indiana U., M.D. 1934, Mayo Clinic, Rochester, Minn.

Reif, Henry Joseph—U. of Minn., M.B. 1939; M.D. 1940, Ancker Hospital, Saint Paul, Minn.

Rinkey, Eugene—U. of Minn., M.B. 1940, St. Mary's Hospital, Minneapolis, Minn.

Rooke, Edward Douglas—Queens U., M.D. 1937, Mayo Clinic, Rochester, Minn.

Ross, John Morse—U. of Oregon, M.D. 1940, Ancker Hospital, Saint Paul, Minn.

Sidell, Chester Marquis—Rush Med. Col., M.D. 1938, Mayo Clinic, Rochester, Minn.

Thornell, William Clyde—U. of Cincinnati, M.D. 1940, Mayo Clinic, Rochester, Minn.

Thorson, Stephen Benedict—U. of Manitoba, M.D. 1936, Mayo Clinic, Rochester, Minn.

Ward, Byron H.—U. of Oregon, M.D. 1939, Mayo Clinic, Rochester, Minn.

Whitehouse, Francis Record—U. of Virginia, M.D. 1938, Mayo Clinic, Rochester, Minn.

By Reciprocity

Sorenson, Philip Woodrow—U. of Iowa, M.D. 1939, Northwestern Hospital, Minneapolis, Minn.

Tanner, Frank Harold—U. of Neb., M.D. 1938, Mayo Clinic, Rochester, Minn.

National Board Credentials

Call, John Daniel—U. of Virginia, M.D. 1938, Mayo Clinic, Rochester, Minn.

Hoagland, Paul Ingalls, Jr.—Stanford U., M.D. 1938, Mayo Clinic, Rochester, Minn.

Minneapolis Man Pleads Guilty to Performing Abortion on Wife

Re: State of Minnesota vs. Melchior Erick Arvidson.

On March 15, 1941, Judge W. W. Bardwell of the District Court of Hennepin County, sentenced Melchior Erick Arvidson, thirty-seven years of age, to a term of not to exceed four years in the State Reformatory at St. Cloud, and then stayed the execution of the sentence, placing the defendant on probation for a period of two years. Arvidson was arrested by Minneapolis police officers on January 26, 1941, in his home at 5621 31st Avenue South, Minneapolis. According to Arvidson's statement to the Police Department, he is a WPA worker and the father of three children ranging in age from nine months to six years. His wife was again pregnant and had told her husband that unless she was able to terminate her present pregnancy, she would commit suicide. The husband stated that his wife purchased a catheter which he attempted to insert into the uterus. He then forced air into the catheter with Mrs. Arvidson dying almost immediately. The cause of death was given as an air embolism from attempted induced abortion. Arvidson was indicted by the grand jury of Hennepin County on February 4, 1941, charged with the crime of abortion. On being arraigned in Court, he entered a plea of not guilty and bail was fixed at $3,000.00. However, on February 10, 1941, Arvidson withdrew his plea of not guilty and entered a plea of guilty, the matter being referred to the Probation Officer of Hennepin County for an investigation.

Arvidson holds no license to practice any form of healing in the State of Minnesota, and neither has he any education in any of the healing arts. There was no evidence to indicate that Arvidson had been engaged in any other similar illegal activities, although he did state that his wife had previously aborted herself on several occasions with elm bark.

Minnesota Supreme Court Upholds Conviction of Minneapolis Physician for First Degree Manslaughter

Re: State of Minnesota vs. R. J. C. Brown, M.B.

On March 7, 1941, the Supreme Court of Minnesota affirmed the conviction of Richard J. C. Brown, M.B., Negro physician of Minneapolis, who was convicted of manslaughter in the first degree on November 22, 1939, by a Hennepin County District Court jury. Brown has been taken to the State Prison at Stillwater to commence his sentence of not less than five and not more than twenty years at hard labor.

Brown was arrested on August 16, 1939, by the Minneapolis Police Department following a complaint being signed against him by the father of a twenty-two-year-old girl upon whom it was claimed that Brown had performed a criminal abortion. The complaint alleged that the abortion was performed on July 31, 1939, the girl dying on August 23, 1939, at the Minneapolis General Hospital. At the trial, Brown did not take the witness stand in his own behalf.

According to the records of the Minnesota State Board of Medical Examiners, Brown was born at Lincoln, Nebraska, January 17, 1893, and graduated from the University of Minnesota on June 17, 1920. He was licensed to practice medicine in Minnesota the same year. The records at the University of Minnesota disclose that Brown never completed his internship and the degree of Doctor of Medicine was never conferred upon him. Brown's license to practice medicine in Minnesota was revoked by the Minnesota State Board of Medical Examiners on February 9, 1940, following his conviction.

MISCELLANEOUS

Chest X-ray Methods

Experimenters have worked to devise a means of making chest x-rays of groups of people, economically and at a rapid rate. Last year approximately 490,000 students received special service which, in most cases, included an x-ray examination. Industrial groups are demanding a similar service. Mobilization for military training has further focused attention on mass methods of x-ray examination. S. Reid Warren, Jr., of the Moore School X-ray Laboratory here presents brief comments of six methods now in use. Estimates of costs and weights are averages from which particular data may differ. The choice of methods depends, of course, on the particular task to be done.

Stereoscopic 14 by 17 inch Films

This is the best single method of chest x-ray examination. It requires expensive ($4,000-$5,000), bulky (1,000 pounds) equipment which must be permanently installed in conjunction with an adequate system to supply electric power to it (230 volts, 35-150 amperes alternating current). Exposure times from 1/30 second to 1/10 second are generally used. A specially equipped darkroom is required to process the films. Two films (unexposed film—$1.50) are required for each examination. It is difficult to make exposures, process the films, and examine them fast enough to use this excellent method for mass surveys. The excellence of this method is the result of (1) high contrast within the diagnostic area of each roentgenogram, (2) small unsharpness or blurring of shadow borders, (3) convenient size for direct viewing, and (4) stereoscopic perception (Fig. 1).

Single 14 by 17 inch Films

The same kind of x-ray generating apparatus is used for producing stereoscopic and single chest roentgenograms. The auxiliary equipment for making single films is less complicated and bulky. Apparatus has been constructed which can be carried in a truck and assembled to examine groups. One film (unexposed—$0.75) is required for each examination. Advantages of this method are (1) high contrast, (2) small unsharpness of shadow borders, and (3) convenient size for viewing (Fig. 1).

Rolls of Paper 14 by 17 inch

Rolls of paper 14 inches wide and about 150 feet long coated on one side with a photographic emulsion are used for this method which was devised specifically for surveys. A roll of paper is mounted within a light-tight mechanism which is arranged so that, after the first roentgenogram is made near one end, the paper can be moved about 18 inches in preparation for the second exposure. After 100 exposures are made, the roll is removed and processed in special equipment. The roentgenograms are viewed by reflected light in a viewing device in which the roll of paper can be mounted. The x-ray apparatus and technic for paper are practically equivalent to those used for 14 by 17 inch film, though slightly more exposure is required for paper. The contrast in paper is less than in film although the diagnostic value appears not to be seriously com-

promised by this deficiency. Apparatus is transportable in a truck, rate of exposure is high (100 per hour), and examination of the roentgenogram is quick and convenient. The company which has developed this method supplies all apparatus, and delivers completed roentgenograms to the physician for $0.75 to $1.00 per patient (Fig. 2).

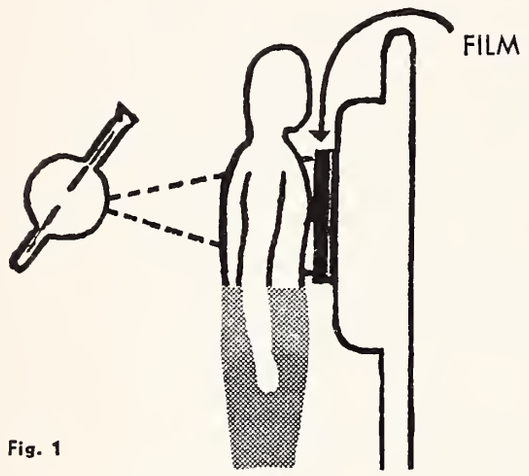


Fig. 1

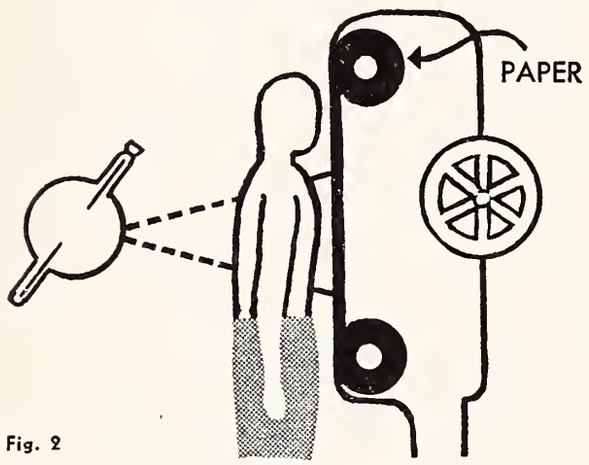


Fig. 2

Photofluorograms

In these methods, *x-rays* pass from the tube through the patient to a (14 by 17 inch) fluorescent screen which is thus caused to emit *light*. A photographic camera is focused upon the fluorescent screen in order to record the pattern of areas of varying brightness of *light* produced on the screen by *x-rays*. The screen, lens, and photographic film must be as fast as possible in order not to require excessive x-ray exposure. High-voltage generating equipment like that used for 14 by 17 inch film is required for photofluorography. Using screen and cameras now available, the unsharpness or blurring of shadow borders is greater in photofluorograms than in 14 by 17 inch roentgenograms.

The lens used to make 4 by 5 inch photofluorograms is expensive ($1,000). The 4 by 5 inch film is large enough to view without magnification. These films can be processed more conveniently than 14 by 17 inch film; the cost (one processed film, $0.06) and filing space are far less for the smaller (4" x 5") film. Four inch film in rolls is not available.

The lens generally used to make 35 mm. photofluorograms is an f:1.5 lens of the type used in miniature cameras. The 35 mm. photofluorogram must be enlarged for clear viewing. Rolls of film can be exposed and processed by means of easily available photographic equipment; the cost (for each processed film, $0.02) of film for each exposure is of course very small.

These methods are being studied in order to find means of overcoming the low contrast and gross unsharpness which are their chief disadvantages (Fig. 3).

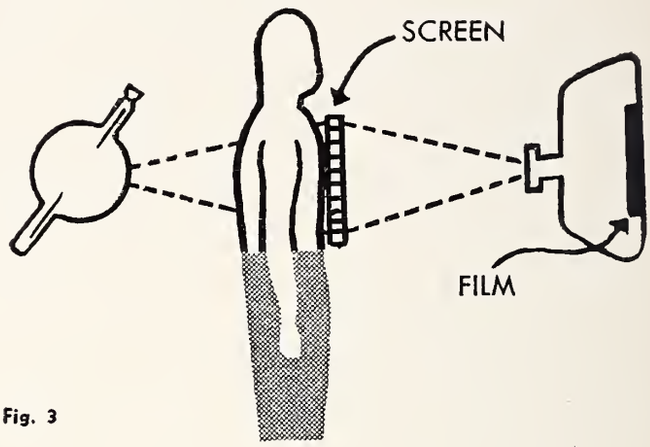


Fig. 3

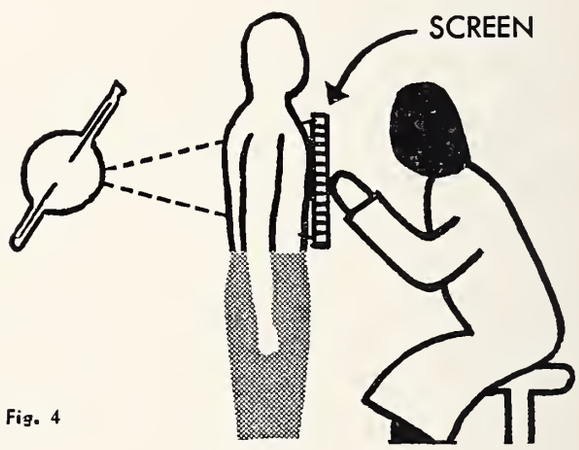


Fig. 4

Fluoroscopy

Apparatus for fluoroscopy is relatively inexpensive ($800) and it requires a relatively low power input (10 volts, 10 amperes alternating current). The physician examines the fluorescent image of the chest in a darkened room and records his opinion. Thus there is no permanent record which can be reëxamined by others. The contrast and sharpness of the fluoroscopic image are greatly inferior to those of a good 14 inch by 17 inch roentgenogram. The physician is subjected to scattered x-rays during the examination. This may be dangerous in a mass survey (Fig. 4).

No x-ray survey method is an adequate substitute for a complete x-ray examination of the chest. The purpose of a survey is to segregate as accurately as possible those subjects whose chests are normal and those subjects who should be referred to a roentgenologist for a complete examination because of suspicious shadows seen by the physician who conducts the survey.—Tuberculosis Abstracts, April, 1941.

OF GENERAL INTEREST

A daughter, Harriet, was born to Dr. and Mrs. Alexander Blumstein of Minneapolis, January 13.

* * *

Dr. and Mrs. John A. Haugen of Minneapolis are the parents of a daughter, Martha Caroline, born February 14.

* * *

Dr. F. A. Willius and T. E. Keys of Rochester are the authors of a book, "Cardiac Classics," which has just been released by the publishers.

* * *

Dr. Theodore F. Hammermeister of New Ulm has fully recovered after an illness of several months, and has resumed his practice in medicine and surgery.

* * *

Dr. and Mrs. George F. Engstrom of Belgrade returned in March after a two-months' vacation in California.

* * *

Dr. Percy C. Johnson, who has been assistant physician at the Tyler Clinic in Tyler, has entered into partnership with Dr. A. L. Vadheim in the clinic.

* * *

Dr. and Mrs. Elmer M. Rusten of Minneapolis will leave April 8 for a month's hunting expedition for Kodiak Bear on the Alaskan Island of the same name.

* * *

The marriage of Miss Carolyn E. George and Dr. Carleton W. Leverenz of Saint Paul took place March 22 in the Fort Snelling chapel.

* * *

Dr. Edgar B. Brown, associate professor emeritus in pharmacology, University of Minnesota Medical School, is making his home in Paynesville, Minnesota. He still maintains his interest in raising flowers.

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Dr. G. J. Thompson of Rochester addressed a meeting of the Southeastern Surgical Congress in Richmond, Virginia, March 10. His subject was "Carcinoma of the Prostate."

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Dr. William F. Braasch of Rochester presented a paper, entitled "Hypertension and the Surgical Kidney," at a meeting of the Cuban Urological Society in Havana, Cuba, March 5.

* * *

Dr. E. V. Allen of Rochester addressed a Founders' Day banquet of the University of Kansas School of Medicine in Kansas City, March 14. He presented a paper, "Diseases of the Peripheral Blood Vessels."

* * *

Dr. James B. Carey of Minneapolis has taken on editing duties in addition to his medical practice. He is editor of the *Nicollet Clinic Bulletin,* a quarterly publication. The first issue of the second volume is scheduled to appear this month.

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Dr. Edward C. Maeder of Minneapolis will give the final lecture in a marriage forum being held by the Minneapolis Seton Guild. He will talk on "Biology of Marriage," at the Seton Guild, April 7.

* * *

Dr. Ernest S. Mariette presented a review of twenty-five years of service of the Glen Lake Sanatorium in a recent issue of the *Bulletin of the Hennepin County Medical Society.*

* * *

Dr. Waltman Walters of Rochester delivered the seventeenth Lewis Linn McArthur Lecture of the Frank Billings Foundation of the Institute of Medicine in Chicago, March 28. His subject was "Pathologic Physiology of the Common Bile Duct."

* * *

Officers of the Minnesota State Board of Health were reëlected at a recent meeting. Dr. E. S. Platou of Minneapolis is president; Dr. T. B. Magath of Rochester, vice president; and Dr. A. J. Chesley, secretary and executive officer.

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Dr. Ralph V. Platou, who is completing work for his Ph.D. in pediatrics at the University of Minnesota Medical School, is to become associated in practice with his brother, Dr. Erling S. Platou, 953 Medical Arts Building, Minneapolis.

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Dr. John O'Hanlon of Norwood has taken over the practice of Dr. Arthur Neumaier of Lindstrom, who has been called to active duty with the United States Army. Dr. Neumaier has been assigned to Carlisle Barracks in Pennsylvania.

* * *

Dr. Leo G. Rigler and Dr. John R. Paine of the University of Minnesota Medical School will go to Chicago, April 10, to present a paper, "Clinical and Roentgenological Manifestations of Acute Abdominal Disorders," before the Chicago Roentgen Ray Society.

* * *

The annual Russell D. Carman lecture, presented under the auspices of the St. Louis (Missouri) Medical Society, was given March 25 by Dr. Byrl R. Kirklin of Rochester. His subject was "Cancer of the Gastro-intestinal Tract: Its Early Manifestations."

* * *

Dr. Irvine McQuarrie, head of the department of pediatrics at the University of Minnesota Medical School, was in Chicago, March 27, to attend a meeting of the Council on Foods and Nutrition of the American Medical Association, of which he is a member.

* * *

En route to Muncie, Indiana, where he was to begin his duties as a staff physician at Muncie Clinic, Dr. J. J. Westra of Owatonna was injured in an automobile accident, March 13. He suffered a fractured leg and jaw, and was taken to a Charles City, Iowa, hospital for treatment.

Dr. E. J. Schmitz, a graduate of the University of Minnesota Medical School, has taken over the surgery practice of Dr. M. C. Kern at Freeport. Dr. Kern is with the 217th coast artillery, United States Army, in California. Dr. Schmitz recently completed his internship at the Northwestern Hospital in Minneapolis.

* * *

Dr. J. A. Williams of Minneapolis has opened offices in Hibbing for the general practice of medicine and surgery. He is a graduate of the University of Minnesota Medical School, and served internships at the Swedish Hospital in Minneapolis and at St. Mary's Hospital in Duluth. * * *

Naval Reserve officers in Minnesota who have been recommended and approved for promotion to the grade of commander in the volunteer reserve of the medical corps include: Dr. Donald McCarthy, Minneapolis, general service; and Dr. A. M. Snell of Rochester, special service. * * *

Construction has been started on a new medical center in Saint Paul to be erected at a cost of between $40,000 and $50,000. Located at East Seventh Street and Mounds Park Boulevard, the center is being built for Dr. E. C. Emerson and associates. There will be quarters for ten doctors and a dentist.

* * *

It may not be generally known that material for preparing addresses to the laity on medical subjects, is available to members of the profession at the Bureau of Health Education of the American Medical Association. Material in the form of clippings is loaned to those so requesting for ten-day periods, at no cost except return postage.

* * *

Guest faculty members for the course in obstetrics at the University of Minnesota Center for Continuation Study, April 3 to 5, included: Dr. James E. Fitzgerald, assistant professor of obstetrics at the Northwestern University Medical School; and Dr. Buford G. Hamilton, assistant professor of obstetrics and gynecology at Kansas University, Kansas City, Missouri.

* * *

Dr. William A. Owens has become associated with Dr. L. R. Lima in Montevideo. A graduate of the University of Minnesota Medical School, Dr. Owens interned at the Kansas City hospital. He was on the staff of the General Santa Fe Hospital at Topeka, Kansas, before going to Montevideo. His wife is the former Hildegarde Lima.

* * *

Dr. Philip S. Hench and Mrs. Hench of Rochester left last month for the South. Dr. Hench is spending a week in Havana where he is continuing his investigation on the history of the conquest of yellow fever. On his return he will conduct a clinic on "Gout" at the American College of Physicians in Boston, and will participate in a symposium on "Chronic Arthritis." * * *

Dr. William A. O'Brien, director of postgraduate medical education at the University of Minnesota Medical School, was in Rockford, Illinois, March 25 to speak at Rockford College and before the Rockford Women's Club.

On March 26, Dr. O'Brien participated in the vocational conference at Carleton College in Northfield. He talked on "Opportunities in Medicine."

* * *

Dr. James S. McCartney, Jr., associate professor of pathology at the University of Minnesota Medical School, presented several papers at a postgraduate course in Winnipeg, March 6 and 7. The course was sponsored by the University of Manitoba Medical School and the Winnipeg Medical Society.

On February 11, Dr. McCartney addressed a meeting of the Cerro Gordo Medical Society in Mason City, Iowa. * * *

Dr. Owen H. Wangensteen of Minneapolis, head of the surgery department at the University of Minnesota Medical School, delivered three lectures at the University of Oregon Medical School in Portland, February 13-15. His subjects were: "Studies on the Etiology of Appendicitis," "Practical Aspects of the Therapeutic Problem in Bowel Obstruction" and "The Ulcer Problem Viewed from the Standpoint of Etiology and Therapy." * * *

Speakers at the first annual meeting of the Central Surgical Association held at the University of Michigan Medical School in Ann Arbor, February 28 and March 1, included Dr. J. Grafton Love of Rochester whose subject was "Glossopharyngeal Neuralgia: Diagnosis and Surgical Treatment." Drs. J. M. Waugh and H. B. Macey, also of Rochester, presented papers, entitled "Carcinoid Treatment of the Cecum" and "Surgical Treatment of Axillary Hidrosadenitis Suppurative."

* * *

The serum laboratory in the department of pediatrics at the University of Minnesota has been enlarged, in order to accommodate a new machine which has been developed for desiccating human plasma, making serum available for use as a blood substitute in the treatment of shock and hypoproteinemia. It is possible that the laboratory may be designated by the United States Surgeon General as one of several centers to furnish such plasma serum in war.

* * *

Dr. Karl Wilhelm Stenstrom, professor of biophysics, University of Minnesota Hospitals, spoke to members of the Women's Field Army for the Control of Cancer, March 12, following a conducted tour of the radiation department of the Cancer Institute, of which he is a director. The tour and talk were followed by a dinner at the Center for Continuation Study, at which reports on the recent regional conference in Rochester were presented. In the evening, members attended the meeting of the American College of Surgeons in Northrop Auditorium, at which Dr. George T. Pack of New York City discussed "Cancer is Curable."

* * *

Dr. Harold S. Diehl, dean of medical sciences at the University of Minnesota, was in Washington, D. C., April 1, to participate in a conference concerned with deferring medical students from military service. He is a member of the Sub-Committee on Medical Education of the Committee on Health and Medicine, National Council on Defense, which met with officers from the selec-

tive service headquarters. The meeting was a continuation of a conference held in March, which Dr. Diehl also attended.

* * *

The John Scott Medal, given by the city of Philadelphia for outstanding achievement in medical science, has been awarded to Dr. Owen H. Wangensteen, head of the department of surgery at the University of Minnesota.

The award, which also includes a cash gift for $1,000, was made for Dr. Wangensteen's development of a suction syphonage treatment of acute intestinal obstruction. For this work, he also was awarded the Samuel Gross medal by the Philadelphia Academy of Surgery in 1934 when the treatment was still experimental.

* * *

Dr. W. A. Fansler of Minneapolis will be among the guest speakers at the annual meeting of the North Dakota State Medical Association in May in Grand Forks. He will speak May 20 on "Diagnosis and Treatment of Carcinoma of the Bowel." The next day he will lead a round-table luncheon discussion on "Office Treatment of Anorectal Diseases."

Dr. Henry E. Michelson of Minneapolis will also participate in the program. He will talk on diseases of the skin, and will also lead a round-table discussion.

* * *

Dr. Willis H. Thompson of Tennessee has returned to Minneapolis to take over the practice of Dr. Chester A. Stewart who has accepted a position as head of the department of pediatrics at Louisiana State University in New Orleans, Louisiana. Dr. Stewart, who has been clinical professor of pediatrics at the University of Minnesota and director of the University's out-patient department in pediatrics, will leave this summer for New Orleans.

Dr. Thompson, who taught in the University of Minnesota pediatrics department ten years, has for the past two years conducted in forty-five Tennessee cities a postgraduate course in pediatrics, sponsored by the Tennessee State Medical Association.

* * *

Dr. A. V. Stoesser, associate professor of pediatrics at the University of Minnesota Medical School, and Miss Gertrude Carlsrud, nursing instructor in premature infant care, Minnesota State Department of Health, were among the speakers at the Conference of State Directors and Maternal and Child Health Service in Washington D. C., March 24, 25, and 26. Dr. Stoesser's subject was "How to Set Up a State Program for Reducing Infant Mortality." His work at the Minneapolis General Hospital is being used as a foundation for state programs.

Representing the Minnesota State Department of Health at the conference were Dr. Viktor O. Wilson, director of the Division of Child Hygiene, and Dr. E. C. Hartley, consultant.

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With Dr. J. J. Westra's moving from Owatonna to Muncie, Indiana, several changes in location have been made by physicians in southeastern Minnesota.

Dr. S. D. Whetstone of Winona has gone to Owatonna to take over the practice of Dr. Westra, and Dr. W. M. Meyer, Rollingstone, has taken over Dr. Whetstone's practice in Winona. Dr. Meyer for the present will maintain evening office hours in Rollingstone where he has been located since August. He has moved his family to Winona.

Dr. Whetstone, who has been practicing in Winona for three and a half years, moved his family to Owatonna the latter part of February.

* * *

Medical reserve officers, who had been ordered to active duty and whose orders have been revoked, include:

Dr. Arthur F. Dworak, captain, Saint Paul, who had been ordered to Fort Bliss, Texas.

Dr. David Albert Burlingame, first lieutenant, Minneapolis, who had been ordered to William Beaumont General Hospital, El Paso, Texas.

Dr. Henry B. Grimes, major, Madelia, who had been ordered to Fort Ord, Presidio of Monterey, California.

Dr. Abraham B. Rosenfield, captain, Hibbing, who had been ordered to Army and Navy General Hospital, Hot Springs, Arkansas.

Dr. Joseph Herman Sagi, first lieutenant, Minneapolis, who had been ordered to Fort Lewis, Washington.

Dr. Raymond Paul Hawkinson, captain, Robbinsdale, who had been ordered to Fort Des Moines, Iowa.

* * *

That the average ability of students admitted to the University of Minnesota Medical School seems to be definitely increasing, was reported by Dr. Harold S. Diehl, dean of medical sciences, in his report to the President of the University for the period 1938-40.

Although several hundred applications for admission to the Medical School are received each year, facilities necessitate the limitation of students accepted to about one hundred. Applicants who are native residents of Minnesota are given preference, with second preference given to applicants from north central states which have no medical schools of their own. Applicants from other sections of the country are accepted only if there are special reasons for so doing, the most common reason being that they are outstanding students and sons and daughters of alumni of the University of Minnesota.

Under new requirements, which became effective in the fall of 1939, requirements for admission include a minimum of three years of college work and courses in physical chemistry, psychology, genetics and eugenics, in addition to the science work previously required.

* * *

Participating in the scientific programs at the fifth annual meeting of the New Orleans Graduate Medical Assembly in New Orleans, March 3-6, were several Minnesota men.

Dr. Paul A. O'Leary of Rochester presented a paper on "The Eczemas," "The Newer Methods of Treatment of Syphilis" and "Nonspecific Therapy of Cutaneous Disease."

Dr. Leo G. Rigler, professor of radiology at the University of Minnesota Medical School, presented two papers, one entitled "Benign and Malignant Tumors of the Stomach," and the other, "Roentgenological Findings in Acute Abdominal Conditions." He also participated in a symposium on hyperthyroids.

Dr. John R. Paine, assistant professor in surgery at the University of Minnesota, also took part in the program, speaking in place of Dr. Owen H. Wangensteen, head of the surgery department, who could not attend. Dr. Paine presented papers on the following subjects: "Postoperative Strictures of the Common Duct," "Diagnosis of Acute Abdominal Disorders," and "Oxygen Poisoning." He also presented the latter paper before students of Tulane University Medical School. "Intestinal Obstructions" was the title of his talk given at a joint meeting with the Orleans Parish Medical Society, March 7.

* * *

Physicians who will deliver lectures this spring in the Minnesota State Medical Association College Lecture Course are: Dr. F. J. Hirschboeck, Duluth, "On Choosing a Doctor," State Teachers College at Moorhead, April 16; Dr. R. M. Burns, Saint Paul, "What Every Student Should Know About First-Aid," State Teachers College at Bemidji, April 18; Dr. J. R. Meade, Saint Paul, "Eating Wisely and Well," State Teachers College at Bemidji, May 23.

Lectures have already been delivered at St. Scholastica, Duluth; Hamline University; State Teachers College at Winona; Concordia College at Moorhead; State Teachers College at St. Cloud; College of St. Teresa at Winona; St. Mary's College at Winona; Carleton College at Northfield; Luther Theological Seminary at Saint Paul; Gustavus Adolphus at St. Peter; Augsburg College at Minneapolis; State Teachers College at Moorhead; and College of St. Benedict at St. Joseph.

Physicians who lectured were: Drs. D. W. Wheeler of Duluth, A. C. Hilding of Duluth, Harold N. Wright of the University of Minnesota Medical School, E. L. Tuohy of Duluth; F. L. Bryant of Minneapolis; W. A. O'Brien of the University of Minnesota Medical School, J. S. Lundy of Rochester, L. R. Boies of Minneapolis, A. V. Stoesser of the University of Minnesota Medical School, J. R. Meade of Saint Paul, M. J. Nydahl of Saint Paul, and A. E. Hansen of the University of Minnesota Medical School.

W. J. Tomsicek of Saint Paul, professor of Chemistry at St. Thomas' College, also took part in the lecture series, giving several talks on "Quacks and Cure-Alls."

* * *

The following medical reserve corps officers were recently ordered to extended active duty by the Commanding General, Seventh Corps Area.

Dr. David William Quick, Jr., first lieutenant, Bayport, to Fort Leonard Wood, Missouri.

Dr. Maurice W. Quigley, lieutenant colonel, Minneapolis, to Camp Joseph T. Robinson, Arkansas.

Dr. Carl Gerald Caspers, first lieutenant, Minneapolis.

Dr. Andrew W. Shea, first lieutenant, Minneapolis, to Scott Field, Illinois.

Dr. Louis Alfred Benesh, first lieutenant, Minneapolis, to Fort Francis E. Warren, Wyoming.

Dr. Harold G. Benjamin, first lieutenant, Minneapolis, to Fort Knox, Kentucky.

Dr. Bernard Alton Flesche, first lieutenant, Lake City, to William Beaumont General Hospital, El Paso, Texas.

Dr. Harold Herman Joffe, first lieutenant, Duluth, to Fort Riley, Kansas.

Dr. Hyman Katzovitz, first lieutenant, St. Paul, to Fort Francis E. Warren, Wyoming.

Dr. Richard Sidney King, first lieutenant, Cass Lake, to Fort Francis E. Warren, Wyoming.

Dr. Carleton Walter Leverenz, first lieutenant, St. Paul, Fort Warren.

Dr. Russell C. Lindgren, first lieutenant, Minneapolis, Army and Navy General Hospital, Hot Springs, Arkansas.

Dr. James Joseph Morrow, major, Austin, to Fort Leavenworth, Kansas.

Dr. Hanns Carl Schwyzer, first lieutenant, St. Paul, Fort Leonard Wood, Missouri.

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In Memoriam

William M. Chowning

Dr. William M. Chowning, Minneapolis, died February 8, 1941, at the Veteran's Hospital, Minneapolis.

Born in Millerburgh, Illinois, in 1873, Dr. Chowning was graduated from Knox College, Galesburg, Illinois, and received his B.A. degree from Johns Hopkins University. In 1901 he graduated from the medical school of the University of Minnesota and taught bacteriology and pathology there. He investigated a spotted fever epidemic in the Bitter Root Valley of Montana in 1907.

Dr. Chowning had been a member of the surgical staff of the General Hospital, Minneapolis. He was a major in the World War and organized a war emergency hospital and dispensary for government employes in the District of Columbia. Later he was made chief of the surgical service and commanding officer of base hospital No. 119 and in October, 1918, he was stationed at Savigny, France.

Dr. Chowning was a member of Alpha Kappa Kappa medical fraternity, was a mason and had been a member of the Hennepin County Medical Society until 1923.

Dr. Chowning is survived by his widow and two sons, and two daughters by a former marriage.

Joseph A. Roy

Dr. J. A. Roy of Red Lake Falls died suddenly while making a professional call, January 30, 1941. He was a member of the Red River Valley Medical Society. His death, which came while he was caring for the sick of his community, bespeaks his faithfulness to their trust in him.

Dr. Roy was born at St. Anaclet, Quebec, Canada, December 10, 1888. His preliminary education was obtained at the Seminary of Rimouski, Quebec. He later attended the College of Medicine at the University of Montreal, from which school he graduated with his

doctor's degree in 1913. He started the practice of medicine at Pelee Island on Lake Erie, leaving there to go to Saint Paul, Minnesota, in 1916. After passing the Minnesota State medical examinations, he opened an office in Kensington, Minnesota, where he practiced until 1919, when he moved to Argyle. He continued there until, in 1922, he decided Red Lake Falls would be his final location. This decision was a happy one, both for himself and his community.

Dr. Roy not only believed in serving his community well from the medical standpoint, but also believed that a doctor should take active interest in the civic and fraternal affairs as well. To render practical value to that statement, he was elected mayor of Red Lake Falls in 1931, and served in that capacity until his death terminated his tenure of office. He was active politically also on a national scale and in 1928 was elected Red Lake County Democratic committeeman, and as such attended the inauguration of President Roosevelt in 1933. His activities extended to fraternal matters also, and his leadership in all matters he entered into was finally rewarded by being elected to the office of State Vice-Chief Ranger of the Catholic Order of Foresters in 1930.

Dr. Roy therefore typified the American general practitioner. He was faithful to his trust in matters medical, but felt it also his duty to cultivate his talents in matters civic and fraternal. His loss will be keenly felt by his numerous medical friends and by his community.

Charles Andrew Erdmann

The passing on February 19, 1941, of Dr. Charles A. Erdmann, formerly of the Department of Anatomy at the University Medical School, saddened the several thousands of graduates who had studied anatomy under him.

Dr. Erdmann was born August 3, 1866, at Milwaukee, Wisconsin, the son of Andrew and Elizabeth Fuch Erdmann. He graduated from the University of Wisconsin in 1887 and obtained his M.D. at the University of Minnesota in 1893. For three years as an undergraduate he served as a student assistant in anatomy. Immediately upon graduating he became affiliated with the Department of Anatomy as Demonstrator until 1894. He was Demonstrator in Anatomy and Assistant in Medicine from 1894 until 1898, Assistant Professor of Anatomy in 1898 and 1899, and full professor in 1899. In 1913 he received the title of Associate Professor of Applied Anatomy, which he held until he retired in June, 1936, at the age of seventy. Upon retirement Dr. Erdmann had been active in teaching anatomy at the Medical School for forty-three years, a unique record for a member of the medical school faculty.

Dr. Erdmann was a member of Acacia and of the Nu Sigma Nu medical fraternity. He was also a member of the Hennepin County Medical Society, becoming an affiliate member in 1926. He was elected to honorary membership January 1, 1929.

He was interested and active in Masonic work, having been a member of the University No. 316 A. F. and A. M. Scottish Rite and a life member of the Zuhrah Temple. He was elected an honorary thirty-third degree Mason in 1911.

Surviving Dr. Erdmann are his wife, Caroline, a daughter, Elizabeth, two sons, Robert of Minneapolis and Charles Edgar of Denver, Colorado, and one grandson.

Dr. Erdmann made teaching his life work and loved it. This was evident to the many students who studied under him, with considerable pleasure and interest, a subject ordinarily considered heavy and dull. He was intensely interested in each individual student and was pleased and proud of every success and honor each may have attained and he won the affection of his many students.

The following poem by Louis Burton Woodward was particularly loved by Dr. Erdmann and a copy of the poem was kept on his desk:

Because I would be young in soul and mind
Though years must pass and age my life constrain,
And I have found no way to lag behind
The fleeting years save by the magic chain
That binds me, youthful, to the youth I love,
I teach.

Because I would be wise, and wisdom find
From millions gone before whose torch I pass,
Still burning bright to light the paths that wind
So steep and rugged, for each lad and lass
Slow climbing to the unrevealed above,
I teach.

Because in passing on the living flame,
That ever brighter burns the ages through,
I have done service that is worth the name
Can I but say "The flame of knowledge grew
A little brighter in the hands I taught,"
I teach.

Because I know that when life's end I reach
And thence pass through the gates so wide and deep
To what I do not know, save what men TEACH
That the remembrance of me men will keep
Is what I've done; and what I have is naught,
I teach.

(Louis Burton Woodward.)

ORIGIN OF GREAT CLINICIANS

There is no better student than the son of a medical father if the boy's heart is in the work, but none is worse than he who, not caring for, or even disliking, the practice of medicine, is urged on by a medical parent to qualify in order to take his place. Better even than the student who, having family traditions, takes to medicine almost by instinct is the boy who, lacking any such associations, determines, whilst still a child, that he will be a doctor. For, in this last case, he may have more than an ideal to study and to advance the science of medicine—he may have a real call to heal the sick and alleviate human suffering. It is from this class that the truly great clinician is derived. Often these students are what might be termed freaks in their families. They appear in every social stratum, and their early decision to become doctors seems often to be unrelated to any outside circumstances. F. Wood Jones, in *Doctors in Shirt Sleeves,* edited by Sir Henry Bashford, London, Kegan Paul, Trench, Trubner & Co., Ltd., 1939.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR APRIL

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

April 5—Cancer in Women
April 12—Radium and X-ray
April 19—When Cancer Begins
April 26—Tumors of the Mouth

STATE MEETING

More than 3,000 physicians from the northwest states are expected to attend the eighty-eighth annual meeting of the Minnesota State Medical Association to be held May 26, 27 and 28, at the Saint Paul Auditorium.

Preliminary arrangements for this event call for an unusually timely program, an extensive scientific exhibit and attractive social events.

Railroad surgeons of the Great Northern and Northern Pacific Railways will join with the Medical Association for this meeting, the Great Northern Railway Surgeons' Association holding its own regular annual meeting concurrently and all uniting on Tuesday, May 27, for an entire day's program on the subject, "Surgery of Trauma."

Four distinguished out-of-state speakers will speak at this session, including Drs. Thomas M. Joyce of Portland, Clinical Professor of Surgery at the Oregon State University Medical School; Sumner Koch of Chicago, Associate Professor of Surgery at the Northwestern School of Medicine; H. H. Kessler, of Newark, New Jersey, and Leroy Sante of St. Louis, Professor of Radiology at the St. Louis University School of Medicine. Dr. Joyce and Dr. Koch are appearing on the program under the auspices of the Great Northern and the Northern Pacific surgeons, respectively. Dr. Sante will give the annual Russell D. Carman Memorial Lectureship under auspices of the Minnesota Radiological Society as part of this program.

Among other well-known guests are Dr. Edward D. Churchill, John Homan Professor of Surgery at Harvard Medical School; Col. G. C. Dunham, Executive Secretary of the Medical Committee of the National Defense Council, and Mr. C. M. Utley, national president of the Foreign Policy Association. Mr. Utley will speak at the Minnesota Alumni dinner, Monday night, May 26, and Col. Dunham will be principal speaker at the annual banquet on Tuesday.

The golf tournament is scheduled for Sunday, May 25, at the White Bear Yacht Club and on Monday night, following last year's successful precedent, there will be an Open House for all who register and their guests in the Auditorium arena. Exhibits will be open for inspection and for entertainment. There will be a Gay Nineties show and refreshments.

Tuesday and Wednesday noons will be devoted to round-table discussion luncheons, ten on each day, with other reunions and luncheon meetings on Monday.

The meeting will close on Wednesday afternoon, May 28, with a general military session at which physical findings among selectees, the nutrition problem in defense and the part played by physicians in defense and in the fighting forces will be discussed. Col. Dunham is scheduled to address this meeting, together with other medical defense authorities.

AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS AND ABDOMINAL SURGEONS

The American Association of Obstetricians, Gynecologists and Abdominal Surgeons offers again an award known as "The Foundation Prize" consisting of $150.00 to the successful contestant who shall submit the best thesis as judged by the Committee on Award. The competition is open to interns, residents or graduate students in obstetrics, gynecology or abdominal surgery, and to practicing physicians. Manuscripts must be submitted before June 1, 1941.

Further information may be obtained from Jasper R. Bloss, M.D., 418 Eleventh Street, Huntington, West Virginia.

AMERICAN COLLEGE OF SURGEONS

Sectional Meeting

The sectional meeting of the American College of Surgeons held in Minneapolis on March 10, 11 and 12, 1941, did not receive the attention which it deserved from surgeons in this state and the adjoining states because of the inclement weather.

The local committees organized wet and dry clinics for general surgery and the surgical specialties which were as elaborate and numerous as those at the Clinical Congress of the American College of Surgeons. Subjects under discussion included fractures, cancer and hospital administration. The hospital conference held many sessions, some of them beginning as early as 7:45 in the morning. Every phase of hospital management was discussed.

The panel discussions were well organized and well attended, the leaders being men and women prominent in the surgical profession. The same can be said for the scientific exhibits. The American College of Surgeons is interested in the work of the young surgeon, and at the University of Minnesota Hospitals the younger men were encouraged to present research problems of general interest.

Although many wet clinics were held in the various hospitals of Minneapolis, the dry clinics seemed to attract the larger number of surgeons and seemed to be a more effective teaching medium than operative clinics. It was suggested that at future meetings the

rooms located in the headquarters hotel used by the College for panel discussions might also be utilized in the morning hours by the various hospital staffs for dry clinics to obviate transportation of the surgeons to the various private hospitals about the city. If this plan is put into effect, the cancer and fracture clinics could be held in two of the large public hospitals.

The committees on arrangements headed by Dr. W. A. Hanson with the assistance of the Hennepin County Medical Society deserves great praise for the excellent arrangements and the instructive clinics and panel discussions.

A Chapter of the American College of Surgeons was organized during this sectional meeting. It is hoped that members of the College in the Twin Cities who practice the various specialties may become better acquainted since at the present time these various surgical specialties have individual meetings. Dr. F. A. Olson of Minneapolis was elected Chairman of this new chapter.

Gilbert J. Thomas, M.D.
Member, Board of Regents
American College of Surgeons

ELIAS POTTER LYON MEMORIAL LECTURES

The second annual Elias Potter Lyon Memorial Lectures in the Physiological Sciences will be delivered at the University of Minnesota Medical School, May 1 and 2, at 8 p. m. by Professor Ernst Gellhorn of the Departments of Physiology and Psychiatry of the College of Medicine of the University of Illinois. The lectures will be given in the Medical Sciences Amphitheater.

Professor Gellhorn's lecture subjects will be: "The Neurophysiological Basis of Some General Adjustment Reactions," and "Investigations on the Central Excitation of the Autonomic Nervous System and Their Significance for the Problem of Schizophrenia."

WILLIAM ROOT LECTURE

Dr. Arno B. Luckhardt of the department of physiology at the University of Chicago, will deliver the William Root Lecture, sponsored annually by the Alpha Omega Alpha medical fraternity, in the University of Minnesota Medical Amphitheater, Tuesday, April 29, at 8:15 p. m.

The subject of his lecture will be "Dr. William Beaumont and the Medical Epoch of the Northwest Territory."

ENDOCRINOLOGISTS FORM SOCIETY

Dr. Leo T. Samuels, assistant professor of physiological chemistry at the University of Minnesota Medical School, has been named chairman of the newly organized society of endocrinologists. Meeting at the Coffman Memorial Union, March 12, members of the society heard Dr. Edwin C. Hamblen, associate professor of obstetrics and gynecology at Duke University School of Medicine.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL LECTURE

Dr. Lucien Brouha, physiologist on the Grant Foundation at Harvard University and professor of human biology at the University of Lieges, Belgium, will lecture at the University of Minnesota Medical School, April 22. He will give an illustrated lecture on the functions of the autonomic nervous system.

COURSE IN SURGICAL PATHOLOGY

The Pathology Department at the University Medical School will give a summer short course in surgical pathology from June 16 to July 25. The course will be similar to that given last year, except that it will occupy twenty instead of fifteen hours each week. In addition to the regular course those enrolled will attend a tumor clinic each week and an x-ray demonstration of bone tumors.

The course is open to members of the profession. Those interested may communicate with Dr. J. S. McCartney, Department of Pathology, University Medical School, Minneapolis.

BLUE EARTH COUNTY MEDICAL SOCIETY

Fifty years as a family doctor were reviewed by Dr. J. A. Hielscher of Mankato at the February meeting of the Blue Earth County Medical Society.

A member of the first class graduated from the University of Minnesota Medical School in 1891, Dr. Hielscher will complete a half century of practice in Mankato in June.

In his talk, Dr. Hielscher recalled the diphtheria epidemic of the '90's; how he went to Chicago in 1896 to see an appendectomy performed after reading about it for the first time; how when he first started practicing, he harnessed the team to his buggy, heated bricks for his feet and wrapped up in buffalo robes before starting out on a winter call.

The passing of the "good" old days brought from Dr. Hielscher regret for only one phase. "The old family physician is disappearing—and I think it is too bad."

MINNEAPOLIS ACADEMY OF MEDICINE

At the meeting of the Minneapolis Academy of Medicine (formerly the Minneapolis Clinical Club), March 13, at the Minneapolis Club, Dr. Edwin C. Hamblen, associate professor of obstetrics and gynecology at Duke University School of Medicine and chief of the endocrine division of Duke Hospital, Durham, North Carolina, addressed the members on "The Sterol Family."

THE MISSISSIPPI VALLEY MEDICAL SOCIETY

The Mississippi Valley Medical Society offers annually a cash prize of $100.00, a gold medal and a certificate of award for the best essay on any subject of general medical interest (including medical

economics) and practical value to the general practitioner of medicine. Contestants must be members of the American Medical Association who are residents of the United States. The winner will be invited to present his contribution at the next annual meeting of the Mississippi Valley Medical Society at Cedar Rapids, Iowa, October 1-3, 1941. Further details may be obtained from Dr. Harold Swanberg, secretary, 209 W.C. U. Building, Quincy, Illinois.

MINNESOTA PATHOLOGICAL SOCIETY

The program for the meeting of the Minnesota Pathological Society, April 22, follows:

"Pathologic Physiology of the Kidney"—Dr. E. T. Bell

"Vitamin B_1 Deficiency from Fish Diets"—Drs. R. G. Green and C. A. Evans.

SCOTT-CARVER MEDICAL SOCIETY

The Scott-Carver Medical Society met at the Mudbaden Sanatorium in Shakopee, March 11. Dr. Frederick Schaaf of Minneapolis spoke on "Avitaminosis."

WASHINGTON COUNTY SOCIETY

The Washington County Medical Society held its regular monthly meeting at Stillwater, March 11. Dr. Charles E. Rea of Saint Paul addressed the members on the subject of "Cryptorchidism." Dr. B. J. Lannin of Minneapolis, a Fellow in Surgery at the University of Minnesota Medical School, was a visitor.

WINONA AND WABASHA COUNTY SOCIETIES

The tenth annual joint meeting of the Winona and Wabasha County Medical Societies was held at Buena Vista Sanatorium in Wabasha, March 3.

Thirty-one were served at the dinner. The program was arranged by Dr. R. R. Hendrickson, superintendent of the Sanatorium. Dr. H. W. Satterlee of Lewiston, president of the Winona County Medical Society, presided. The addresses were:

An outline of the setup and work done by the medical department of the State Division of Social Welfare. H. E. Hilleboe, M.D., Medical Director.

"Treatment of Some Common Dermatoses"—Dr. F. W. Lynch, M.D., Saint Paul.

"Physical Examinations under the Selective Service Act"—Lt. Col. Hullsick, State Medical Director.

A talk on present trends in medicine and plans of the State Medical Association.—B. J. Branton, M.D., President.

WOMAN'S AUXILIARY

Mrs. M. A. Nicholson, Duluth, Minnesota, *President*
Mrs. E. V. Goltz, 2259 Summit Avenue, Saint Paul, *Publicity Chairman*

Only a few more weeks and the members of the Woman's Auxiliary of the American Medical Association will be arriving in Cleveland for their annual convention, June 2-6. Have you made your reservation? If not, send your request *at once* to Dr. Edward F. Kieger, Chairman of Committee on Hotels and Housing, 1604 Terminal Tower Building, Cleveland.

* * *

Mower County Auxiliary held a meeting February 24 at the home of Mrs. F. W. Molgren, in Austin. The regular business meeting was followed by a luncheon and bridge.

* * *

The home of Mrs. O. V. Johnson, Fergus Falls, was the meeting place for members of the *Park Region Auxiliary* recently. The doctors and their wives enjoyed dinner together and after the dinner the Auxiliary members held their business meeting and social hour. Mrs. Norman Baker of Fergus Falls has been selected State Health and Summer Round-Up chairman for the National P.T.A.

* * *

Dr. and Mrs. J. B. Vail and son have left for San Diego, California, where Dr. Vail will be in the Army service. Mrs. Vail is a member of the Park Region Auxiliary and shared honors with Dr. Vail recently at a farewell party which was given by Dr. and Mrs. E. C. Perreten.

* * *

Wabasha County Auxiliary recently elected Mrs. Earle Ellis of Elgin, president. The meeting was held at the home of Mrs. B. J. Bouquet. Mrs. D. G. Mahle of Plainview is the retiring president. Mrs. B. J. Bouquet was elected vice president for another year and Mrs. L. F. Race of Plainview was elected secretary-treasurer to succeed Mrs. M. F. Campion of Lake City. The Auxiliary recently awarded a one dollar prize to Florence Walch of Plainview for her essay on "Tuberculosis," which was judged the best of 160 essays submitted by the five Wabasha County schools.

* * *

The Merchants Hotel at Morris was the scene of the regular meeting of the *West Central Auxiliary,* March 6. After the dinner meeting with the doctors the Auxiliary members met at the home of Mrs. F. W. Behmuler, where Mrs. M. A. Nicholson, state president, was the guest of honor.

An astonishingly large percentage of intelligent people conceive of available knowledge as comprising nearly all that may be known. It has required the shock of many recent discoveries in physics, chemistry, astronomy and biology to make clear the fact that our acquaintance with much that is nearest to us is still distinctly inadequate.—John C. Merriam in *Think.*

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

IT IS YOUR LIFE. Keep Healthy, Stay Young. Live Long. Max M. Rosenberg, M.D., Member American Medical Association and New York County Medical Society. Formerly in charge of Clinical Laboratory O.P.D. Beth Israel Hospital, Clinical Assistant Internal Medicine, Beth Israel Hospital, Clinical Assistant in Pediatrics, Gouverneur Hospital. 450 pp. Illus. Price $2.50. New York: The Scholastic Book Press, 1940.

This, enthusiastically proclaims the jacket, differs from the numerous "health and medical advice books" which undertake to teach the reader to diagnose and treat every imaginable disease under the sun, from apoplexy to pinworms. To be really comprehensive it might have made the range to include everything from the Egyptian AAA disease to the Hebrew zaarath, but let that pass; we are not pedantic.

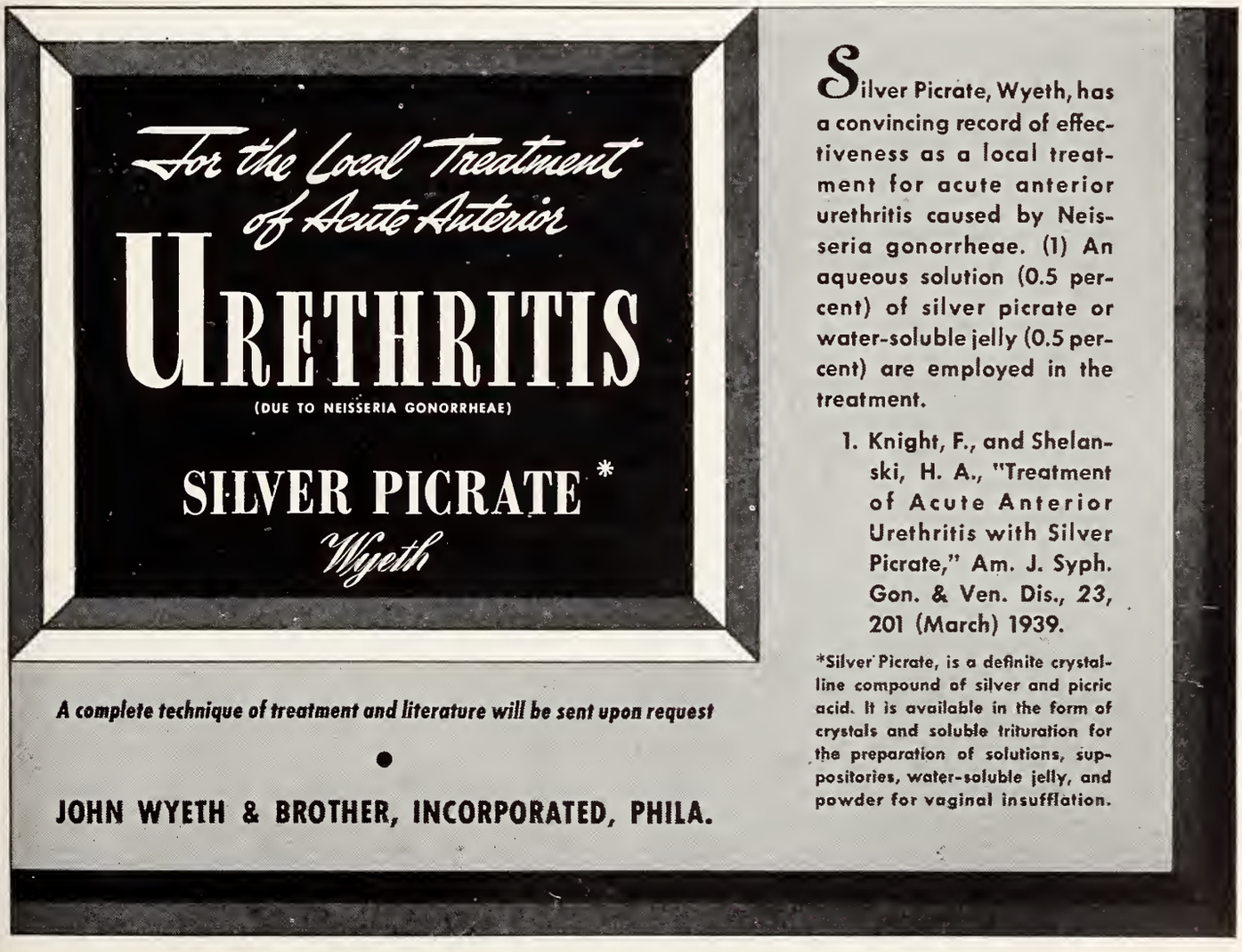
The book contains a lot of fairly good advice on personal hygiene, diet and the cultivation of correct mental attitudes. On the other hand, in his evident desire to reform the race the author goes far afield when he undertakes to impress the baleful effect of various drugs. His attack on the demon rum carries us back to the days of the hobnail liver pictures in the school books. We are not aware of any experienced pathologists who would agree with the author's statement that "autopsies on thousands of cases all over the world have shown that in habitual drinkers all the organs of the body without exception undergo degeneration" followed by the gruesome details.

The author denounces the use of sulfanilamide in a way that would make a patient distrust or discharge a physician who prescribed it and in one place actually advise the reader not to let his doctor give him a certain drug. On the whole, however, he is loyal to his own profession and emphasizes the value of the advice of a competent physician; the latter will have an easier time with his patient if he does not have to argue against some of the pontifical statements in the book.

GILBERT COTTAM.

ILLUSTRATIVE ELECTROCARIOGRAPHY. Julius Burstein, A.B., M.D., Associate Electrocardiographer and Chief of the Cardiac Clinic, Morrisania City Hospital, New York. Originally written by the late Joseph H. Bainton, A.B., M.D., and Julius Burstein, A.B., M.D. Second edition. 292 pages. 106 plates. Price, $4.50. New York, London: D. Appleton-Century Company, Incorporated, 1940.

Beautifully, clearly, concisely, illustratively written. Simple descriptive style, easily understandable; grada-



tion from the simplest of fundamentals through the latest and completest survey of the entire field of electrocardiography.

The new fields of coronary occlusion; precordial (chest) leads; verbatim report on the "Standardization of Precordial Leads" from the American Heart Association and its supplementary report on "Multiple Precordial Leads" are exhaustively and understandably presented. The serial presentations are illuminating and instructive.

The reviewer hopes for a more extensive treatise of electrocardiography in childhood, rheumatic heart disease progress, congenitally defective heart and the miscellaneous group. The third edition will be welcomed, with a shorter publication interval.

LILLIAN L. NYE, M.D.

SYMPOSIUM ON THE SYNAPSE. Herbert S. Gasser, Joseph Erlanger, Detlev W. Bronk, Rafael Lorente de Nó and Alexander Forbes. 113 pages, Illustrated with 25 diagrams and graphs. Springfield, Illinois, and Baltimore, Maryland: Charles C. Thomas, 1939.

The material contained in this booklet formed the subject matter of a symposium on the mechanism of synaptic transmission held in Toronto on April 29, 1939, under the auspices of the American Physiological Society at its annual meeting. Originally published in the *Journal of Neurophysiology* (2:361-472, 1939), it is now reproduced in this form for permanent use, with considerable revision and extension of the papers of Bronk and Lorente de Nó. The voluminous references are properly arranged in alphabetic order and there is an adequate index. It is "Dedicated with respect and affection to Charles Scott Sherrington, O.M., who introduced the concept of The Synapse, as well as the word itself, into the literature of neurophysiology."

The symposium was made up of the following components:

H. S. Gasser, who is Director of the Rockefeller Institute for Medical Research in New York City and acted as chairman of the symposium, contributed the article on axons as examples of nervous tissue, with prominent mention of the recent work of Eccles and Pritchard on the action potential of motorneurones, published in the *Journal of Physiology* (89:43-45, 1937).

Joseph Erlanger, Professor of Physiology in Washington University, Saint Louis, discussed the initiation of impluses in axons and hoped that the evidence he presented would indicate that an electrical mechanism could account for synaptic transmission whatever else might be involved.

Detlev W. Bronk, Director of the Eldridge Reeves Johnson Research Foundation and of the Institute of Neurology, University of Pennsylvania, Philadelphia, read the third paper, on synaptic mechanisms is sympathetic ganglia, without "desire to defend either the acetylcholine hypothesis or the theory of excitation by circulating currents from the presynaptic terminations. On the other hand I do not wish to oppose them or to adopt a dualistic hypothesis. If it be necessary to do more at this time than describe the phenomena of transmission and relate them into a consistent scheme, I would argue for a pluralistic theory."

Rafael Lorente de Nó, co-worker of Gasser in the Rockefeller Institute, contributed the fourth article, on transmission of impulses through cranial motor nuclei, much the most comprehensive of the five contributions and occupying more than one-half of the space in the book. He mentioned many experiments which have revealed data that have significant bearing on the problem of synaptic transmission of impulses to motorneurons, which help to state but are insufficient to solve the problem.

Alexander Forbes, Professor of Physiology in Harvard Medical School, summed up and commented on the issues involved. The entire symposium revolved around the controversy between those who advocate the original electrical theory of transmission through synapses and those who believe in the newer idea of chemical stimulation, called elsewhere by Walter B. Cannon the electragonists and the chemagonists.

While highly abstruse it should be interesting to anyone who is familiar with the fundamentals of neurophysiology to follow these trained workers into fastnesses of uncharted terrain. That the solution is not yet in sight by no means detracts from the fascination of listening to the arguments and experimental evidence of the controversialists.

GILBERT COTTAM.



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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 24 MAY, 1941 No. 5

BLOOD TESTS TO PROVE NON-PARENTAGE*

REPORT OF SPECIAL COMMITTEE

THE president of this association was prompted to appoint this Committee on "Blood Tests to Prove Non-Parentage" by the report of the Committee on Jurisprudence and Law Reform of the Minnesota State Bar Association at its meeting last July in which it was proposed that a bill be submitted to our legislature, modeled after the Wisconsin law, making blood tests admissible in evidence in matters involving paternity. The Wisconsin statute grants the court the power to direct that the complainant, the child, and defendant submit to blood tests to determine whether or not defendant can be excluded as a possible father of the child, makes the results of the tests admissible in evidence only in cases where definite exclusion is established, imposes the cost of such tests upon the county and provides further that, if one of the parties refuses to submit to a test when ordered, such fact shall be disclosed upon trial unless good cause to the contrary is shown.

In 1900 Dr. Landsteiner, of the Rockfeller Institute of Medical Research, discovered that four different groups of human blood result from the varying occurrence of two agglutinable substances in the red blood cells, which substances were designated *A* and *B*. The four groups are:

1. Group A—persons having only substance *A* in their blood cells (40% of population).
2. Group B—persons having only substance *B* (15% of population).
3. Group AB—those having both substances *A* and *B* (5% of population).
4. Group O—those having neither *A* nor *B* (40% of population).

Dr. Landsteiner at the same time also announced that the blood serum contained two substances, called agglutinins, designated by Greek letters *a* and *b*, meaning anti-*A* and anti-*B*. Group *A* persons have agglutinogens *A* and agglutinins *b*. Group *B* persons have agglutinogens *B* and agglutinins *a*. Agglutinins *a* (found in group *B* persons and meaning anti-*A*) when mixed with the blood of a group *A* person, cause the latter's red blood cells to "bunch," "clump" or agglutinate, but, when mixed with the blood of a group *B* person, cause no unfavorable reaction. Agglutinins *b* (found in group *A* persons and meaning anti-*B*), when mixed with the blood of a group *B* person, cause the latter's red blood cells to "bunch," "clump" or agglutinate but cause no unfavorable reaction when mixed with the blood of a group *A* person.

This discovery was of the greatest importance in blood transfusions. Before that time fatal reactions frequently occurred in blood transfusions. This was puzzling because it was assumed that the blood of individuals of the same species must be identical, but Landsteiner solved this mystery when he discovered the existence of four different human blood groups. These four blood groups are found in individuals of all races. Today, as you know, the blood of willing donors is tested to obtain the proper blood grouping before a transfusion is made. For this discovery, Dr. Landsteiner won the highest recognition of science, in 1930, the Nobel Prize.

His discovery was soon to have a new significance. A preliminary study by Ottenburg and Epstein suggested the heredity nature of these blood groups. Van Dungern and Hirszfeld made the first extensive study in 1910 and in 1925 Bernstein evolved the law now accepted.

*Report to the Minnesota County Attorneys' Association at its annual convention in Duluth, Minnesota, December 27, 1940, made by the Committee appointed by the President of the Association on "Blood Tests to Prove Non-Parentage."

Thus we have the following classification and composition of blood groups:

Groups	Cells (agglutinogens)	Serum (agglutinogens)
O	——	a and b
A	A	b
B	B	a
AB	A and B	——

From this discovery two laws of heredity of blood groups can be stated:

1. The agglutinogens *A* and *B* cannot appear in the blood of a child unless present in the blood of one or both parents. This is known as the law of Van Dungern and Hirszfeld.

2. Individuals of group *AB* cannot have children of group *O* and group *O* individuals cannot have group *AB* children. This is known as the Bernstein law.

A test of 20,000 children has not revealed a single exception to the first law of heredity. The Committee appointed by the American Medical Association, consisting of Dr. Landsteiner of the Rockefeller Institute of Medical Research of New York, whom I have mentioned, Dr. Wiener of New York, one of the best recognized authorities on the subject, and Dr. Hektoen, a Chicago expert, recently recommended to the House of Delegates of the American Medical Association that this law of heredity be accepted without reservations. This report was adopted by that Association.

Under the Bernstein law, 4000 mothers of group *O* with their 5000 children have been tested and not a single child was found to belong to group *AB*, and 600 group *AB* mothers with their 1000 children have been examined and among these there was only one real exception to Bernstein's theory. In this case, the mother belonged to group *AB* and the child to group *O*. The American Medical Association Committee therefore recommended in such cases that it should be stated merely that parentage is extremely unlikely or that parentage is excluded with a high probability, bordering on certainty. Under the language of the Wisconsin law, under such findings, there would not be a definite exclusion and, accordingly, the results of the tests could not be used in evidence and defendant could not have the benefit of them.

More recently in 1928, Dr. Landsteiner, with the aid of Dr. Levine, discovered two new agglutinogens in the red blood cells. These are known as *M* and *N*. They had not been previously observed because normal human or animal sera do not contain agglutinins against *M* and *N* substances. Therefore, it is necessary to inject human blood into animals such as rabbits, or other animals such as cats or goats, in order to obtain sera with agglutinins *M* and *N*. The *M* and *N* factors are entirely independant of *A* and *B* factors. Unlike the *A* and *B* factors it is not necessary to consider them in blood transfusions. The red blood cells of a person may be without either the *A* and *B* substances, but they always have substances *M* or *N* or both. A test of more than 50,000 persons has not disclosed a single exception. In reference to these substances all persons fall into three types. (The use of the word "type" is recommended by the Committee of the American Medical Association to distinguish it from the word "group" as used in reference to substances *A* and *B*). The three types are:

1. Type M—person having only substance *M* in their blood (25% of population).
2. Type N—persons having only substance *N* in their blood (25% of population).
3. Type MN—persons having both *M* and *N* substances in their blood (50% of population).

The *M* and *N* factors are also hereditary and are always inherited. The tests prove two laws of heredity:

1. Agglutinogens *M* and *N* cannot appear in the blood of a child unless present in one or both parents.

2. Type *M* parents cannot have a type *N* child and type *N* parent cannot have type *M* child, regardless of the type of the other parent.

Seven thousand tests revealed no exception to these laws. The American Medical Association Committee, previously referred to, therefore, states in its report that the foregoing laws as to *M* and *N* types can be accepted without qualification.

There are, however, sub-groups of groups *A* and *AB* which are believed to be hereditary but there have been certain exceptions to that theory in a few recent reports. Furthermore the technic in determining sub-groups offer certain dif-

ficulties. The American Medical Association Committee feels, therefore, that the application of sub-groups *A* and *AB* is not well enough established to be used at present as a routine procedure. In other words, the results of the tests in such cases would be regarded as inconclusive and not admissible in evidence.

Carefully prepared tables are available showing the possible groups and types to which the father must belong if the group and type of the mother and the child are known. If the father does not belong to one of these groups or types, then he is definitely excluded as the possible father of such child. For instance, if the child in question has substance *A* in its blood cells and its mother does not have, then its father must have substance *A* in his blood cells. If the test shows that the defendant does not belong to group *A*, he is definitely excluded. If, however, he has substance *A* in his blood cells, the test would say that he could be the father of the child. On the other hand, if the child had substance *B* in its blood cells and the mother did not, then the alleged father must have substance *B* in his blood cells; otherwise he would be definitely excluded. But if the test for *A* and *B* does not exclude the defendant as a possible father, the more difficult test for *M* and *N* must be made. If, for instance, the child has only substance M in its blood cells, it follows that only a person belonging to type *M* can be a possible father. Therefore, if the test shows that the defendant belongs to type *N*, he would be definitely excluded as a possible father. But if neither test excludes the defendant as a possible father, the answer of the test would be that he could be the father of such a child. In other words, the test operates as negative proof—never as affirmative proof. It cannot say to the defendant, "You are the father of this child." It can say to the defendant, in a limited number of cases, "You cannot be the father of this child." Blood tests cannot prove paternity. They can disprove paternity in one out of every three falsely accused persons. The *A* and *B* test can exclude 16 per cent of the falsely accused and the *M* and *N* test about doubles the percentage.

Medical authorities are universally agreed that, within the limits explained, blood tests are absolutely reliable when made by thoroughly qualified experts. The *Journal of American Medical Association* of July 27, 1940, states:

> There would seem to be no justification for further hesitancy on the part of the courts to accept as scientifically sound the results of blood grouping tests to the extent that they disprove the possibility of paternity.

Blood tests in paternity matters have received much consideration in the law reviews and law journals of our country during the past five or six years. Nearly every law journal and law review of the larger universities have had exhaustive articles on the subject. Your committee has read many of them. All uniformly strongly advocate the use of blood tests. We are informed that this is the view of the law reviews and journals throughout the country. In fact most of these reviews are impatient with the delay of the courts in accepting the reliability of blood tests, *Minnesota Law Review* leading the field in this respect (see "Blood Grouping Tests and more 'Cultural Lag'" 22 Minn. Law Rev. 836).

The Oregon Law Review for April, 1938, page 190, states:

> Upon the basis of this unanimous acceptance of the A-B and M-N blood tests by the courts in civil and criminal cases in the new and old worlds, there seems to be no valid objection to the acceptance of this valid scientific fact by the courts of the United States. Blood tests are incontrovertible evidence and absolutely conclusive within their limits.

Strangely enough, though blood groups and types, the laws of their heredity, and their significance, were all discovered in America, Europe was the first to make the earlier and greater use of them in paternity cases. The first case of blood tests in paternity matters in the courts in Europe occurred in 1926. Our first was in 1931 in Pennsylvania. Prior to 1930 when the *M* and *N* factors were first discovered, European courts had already had nearly 7,000 cases of blood tests under the A and B groups. By 1932 Europe started using the *M* and *N* tests discovered only a few years before. Up to April, 1938, Europe had had nearly 9,000 recorded cases, with nearly 900 exclusions. These were principally in Germany (5,430); Sweden (859); Austria (829); Danzig (756) and Denmark (669). Up to the same time the United States had had 213 cases with thirty exclusions. Of these, 181 were in New York state and nineteen in Ohio, with a percentage of exclusion in the United States of 9.8

per cent as compared with 9.7 per cent in Europe. Since 1930 when the *M* and *N* test was discovered there have been 2,095 cases in Europe with 300 exclusions or 14.2 per cent. Tests are quite regularly used in the countries just mentioned. Austrian courts refuse to protect a litigant who refuses to submit to a blood test. France, Italy and Spain, however, make little, if any, use of the blood tests.

In the United States, courts have availed themselves of the blood test much more slowly. The courts in many states as well as our federal courts held they are without authority to order a blood test without a statute specifically authorizing it. Some states, however, notably Ohio and South Dakota, held that the court had inherent power to order such tests. New York lead the way in 1935 by passing a statute providing for blood tests in parentage cases and making the result of such test admissible in evidence, if it definitely established exclusion. In the same year, Wisconsin passed a similar law which is now proposed as a model for Minnesota. It was sponsored by Dr. Levine, one of the discoverers of the *M* and *N* factor. He was once a member of the faculty of the University of Wisconsin Medical School. In 1939, Maine, New Jersey and Ohio passed similar statutes. In 1937 the California legislature passed such a law but it was pocket vetoed by the Governor. Other states have considered such a statute but for one reason or another have failed to pass it.

As indicated in the discussions in the law reviews and journals and by the decisions of the courts, the reliability of blood tests is being recognized more and more by our courts—both in states having blood test statutes and those having none. In New York—which has a statute—blood tests are always ordered when requested by the defendant. The corporation counsel of the City of New York, who prosecutes paternity cases, quite uniformly dismisses a case when blood tests definitely establish exclusion of paternity. He regards the law as very beneficial.

The attitude of the courts of other states is indicated by the following much cited cases:

Ohio: State ex rel. Slovak v. Halod, 24N.E.(2d)962 (1939); 63 Ohio Appeal 16.

Here the defendant was convicted in a bastardy proceeding although the blood tests definitely excluded him as a possible father. On appeal defendant contended that the verdict was against the weight of the evidence and that the trial court erred in refusing to instruct the jury as to the weight to be given to the results of the blood tests. If given, these instructions would have permitted the jury to decide the case on that evidence alone. In affirming the trial court's decision it was held that, since absolute conclusiveness and infallibility of blood grouping test results had not been definitely established, the court would not be justified in ruling that the test results in this case should nullify all the complainant's evidence to the contrary. Moreover, the court raises the point that a ruling to that effect would also have to presuppose absolute honesty and thorough competence on the part of the expert, and also the preclusion of all chances of innocent mistakes.

Pennsylvania: Commonwealth v. Zammerelli, 17 Pa. D.&C.229(1931). Defendant was tried on indictment for fornication and bastardy and was convicted though blood tests showed he could not be the father. A new trial was granted because the verdict was against the weight of the evidence.

California: Arais v. Kalensnikoff, 10Cal(2d)428; 74 Pac.(2d)1043(1937).

This was an illegitimacy case. Blood tests made by consent showed defendant could not be the father. He was seventy years old. The court found the defendant to be the father. The court of appeal reversed the lower court because the verdict was not supported by substantial evidence. Later the Supreme Court sustained the trial court holding that evidence of blood tests did not render other testimony superfluous, but since the scientific evidence and other evidence conflicted, the trial court must determine the relative weight of the two types of evidence.

Wisconsin: Euclid v. State 231 Wis. 616, 286 N.W. 3(1939). A blood test was ordered in a bastardy proceeding and the result showed the defendant could not be the father. Evidence of the test, however, was excluded, because not made in accordance with the statute.

The court said on page 620 (231 Wis.):

> In view of the several unsatisfactory and improbable aspects of the testimony, and in view of the positive exclusion of defendant by the blood test, however irregularly offered, we feel that in the interests of justice this case should be retried under circumstances that will give to plaintiff in error an opportunity to present in proper form medical conclusions based upon blood tests.

South Dakota: State v. Damm, 62S.D.123, 252N.W.7, 104A.L.R.430(1931).

Defendant was convicted on indictment for rape of an adopted daughter. Shortly before the trial closed, defendant offered to submit to a blood test and requested a blood test also for the child and its mother, which request was denied. On appeal the Supreme Court, speaking of the record in the case, said on page 446(104A.L.R.):

> We recapitulate the views hereinbefore set forth by saying that we think (1) the reliability of the blood test is universally conceded by competent scientific authorities; (2) a trial court of record in this state has inherent power and authority in its reviewable discretion, to order the taking of blood for such purposes in cases where paternity is an issue.

On rehearing in 1936, the Supreme Court said the reliability of the blood test was then universally conceded by competent scientific authority. The Court mentioned that the case was originally tried in 1931 and that practically all the literature on the subject was since that date, but by assistance of able counsel and its own investigations, the Court had arrived at a complete belief in such reliability. A new trial was refused because of the state of the record. Here the other evidence against the defendant was strong.

District of Columbia: Here the United States Court in 1940, according the *Journal of American Medical Association* of July 27, 1940, accepted as established the scientific value of blood grouping tests to the extent that they disprove paternity, basing its conclusion primarily on the report of the committee of that association on blood grouping tests, which report we have previously quoted.

These and other cases do not make blood tests conclusive but when performed by experts they are regarded as evidence of high probative value. The courts are ready to accept the reliability of blood tests within their limits when performed by known experts.

But these limits and the skill required in performing these tests present real problems. We have already pointed out that the committee of the American Medical Association reports that tests in the case of sub-groups *A* and *AB* are not sufficiently established for routine procedure and that group *AB* persons cannot be definitely excluded as parents of group *O* children.

Furthermore, medical men do not agree on how soon after birth reliable blood tests can be made. All medical men agree that *M* and *N* factors are present at birth, but there is disagreement as to when the *A-B* factors become fixed in a child. Many eminent authorities including Dr. Landsteiner and Dr. Wiener are positive in their conclusions that the *A-B* agglutinogens are fixed at birth, though the agglutinins do not become fixed until later, but that the agglutinins are not necessary for the tests and that reliable tests for *A-B* factors can be made immediately after birth.

However, Dr. Unger, one of the experts on the New York court list, states that in many cases these agglutinogens do not become fixed until a year or more after birth. Mr. Potter, Science Editor of the *American Weekly,* and Dr. Larson, a well known immunologist of our own university, are of the same opinion. Your committee believes that the weight of medical authority supports the view that the *A-B* factors are fixed at birth, but the disagreement among medical authorities on that point creates an uncertainty and dispute. This uncertainty should first be resolved by the medical profession—it should not be allowed to be carried into the courts for laymen to pass upon. If the tests are performed before the lapse of the period in dispute, it will greatly affect their reliability. If the trial is postponed for the purposes of these tests beyond the disputed time, it will mean a delay of eighteen months in counties having court only twice a year. This will greatly affect the practicability of the tests.

All authorities, including the law journals which strongly advocate the use of blood tests, are agreed that "the tests are rather difficult to make and expert skill is needed. If put into the hands of incompetent investigators disastrous results will follow." 2 Ohio State Law Review, 212 (May 1936). The higher the medical authority the greater is its insistence upon the need of a thoroughly competent expert.

Dr. Fishbein, editor of the *Journal of the American Medical Association,* in a response to a letter of this committee states:

It is hardly correct that "tests can be made for the *A, B, AB* and *O* groups by most hospitals and doctors." Only experienced serologists can reliably carry out and interpret such tests for medico-legal purposes. That holds true to a still greater extent for the determination of the blood types *M, N* and *MN.*

Although there are only fourteen experts on the court list in New York City, who are recommended by the Medical Society of that state as qualified to make these tests, some outstanding authorities contend that that very limited list is too inclusive and that there are only about three or four in New York City and one or two in the remainder of that state qualified to make such tests. When we consider that this list includes Dr. Landsteiner, who discovered the *A-B* and *M-N* factors, and Dr. Levine, who helped to discover the *M-N* factors, and Dr. Weiner, who is one of the greatest authorities on blood tests, we can appreciate the degree of skill required.

It is interesting to note that in Oregon, as recently as 1938 "only tests for *A-B* were made, since there are no facilities for testing for *M-N.*" 17 Oregon L. Rev. 203. These tests are made by Dr. Hunter of the University of Oregon Medical School.

In a very recent Wisconsin case, although a blood test statute has been in effect in that state for more than five years, an expert appointed by the court did not make the test for *M* and *N*, despite the fact that the test for *A-B* did not exclude the defendant as a possible father. The defendant was convicted and appealed to the Supreme Court, asserting as one of his grounds for a new trial the fact that he had been denied the right of a proper blood test. State v. Van Pappen 294 N.W. 560 (Nov. 8, 1940).

This Committee has given study to the availability in Minnesota of experts of unquestionable ability to perform these tests. Even many of the larger hospitals and clinics advise that they are not equipped to make tests for *M* and *N*. Others, including the Mayo Clinic, decline to make the tests for legal purposes. There is a readily understandable reluctance on the part of many to enter this field because it involves taking part in litigation and attendance in court takes experts away from their work. The test for *M* and *N* requires the greater skill. These tests have no value except to disprove paternity. The number of thoroughly qualified experts in Minnesota is very limited, due, no doubt, to the small demand for such tests. The Wisconsin statute contemplates several tests in some cases and the appointment of more than one but not to exceed three experts. This Committee is not convinced that there are a sufficient number of experts, willing to perform these tests, available in Minnesota whose ability would be unquestioned nor is it certain that the passage of the statute recommended would justify a sufficient interest to develop the technique required. It should, of course, be noted that the law provides for the cross examination of experts making the test. Securing the presence at the trial of such experts presents a difficulty, in expense at least, which should not be over-looked.

Your committee accordingly is of the following opinions:

1. That the results of blood tests within the limits herein outlined are reliable and when the uncertainties herein mentioned have been removed can be of great value in paternity cases,

(a) In discouraging the making of false accusations against innocent defendants.

(b) In causing a guilty defendant to admit paternity.

(c) In further reducing the possibility of convicting falsely accused persons.

(d) In rendering less uncertain the determination of fatherhood for illegitimate children.

2. That, because of the uncertainty of the availability of sufficient experts of the highest qualifications in this state, willing to perform these tests, and because of the difference of opinion as to when *A* and *B* factors become fixed in a child, it would be unwise to recommend the passing of such a law at this time, nor until there is a satisfactory answer to these problems; and that a blood test statute passed now might retard, rather than hasten, its beneficial use.

That, if and when a blood test law is passed, this Association should take a part in helping to determine what experts have the necessary qualifications and that only experts of unquestioned competency should be appointed.

4. That, if and when a blood test law is passed, it should make the cost payable by defendant. (Wisconsin alone provides for payment by the county and even there the Committee is informed the court often makes the order for the blood test conditioned upon payment of the costs by the defendant.)

5. That the place of the blood test in court should not be the addition of another item of evidence about which experts might argue and courts and juries disagree, but since it establishes, within certain limits, a biological fact which is undisputable, its use should be postponed until the uncertainties herein mentioned have been cleared away and until sufficient experts of unquestioned standing are available and willing to perform these tests.

In conclusion, it should be stated that this Committee, during its study, made effort to resolve the difference of opinion as to the fixation after birth of the *A* and *B* substances, but without success. It is hoped, however, that this study will, in a small measure at least, hasten the solution of the problems herein outlined and thereby help to make available an early beneficial use of blood tests in paternity cases.

Respectfully submitted,

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THE SEROLOGY OF SYPHILIS AND ITS EVALUATION*

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THE diagnostic value of the serology of syphilis has always been controversial, not because the reactions are based on unsound immunologic principles, but mainly because of intricate biologic interference with the mechanisms of immunity, especially when in-vitro demonstrations are attempted. The various flocculation and complement fixation reactions are immunologically identical and depend upon specific antibody affinity for the antigen. Under certain circumstances, non-syphilitic elements in the patient's serum may unite with the cholesterol reinforced beef heart extracts usually employed as an antigen in the serodiagnosis of syphilis. In the serologic procedures in current use such nonspecific unity is indistinguishable from true syphilitic reactions. Several investigators[1,2,11] have obtained satisfactory sensitivity by employing a treponema pallida antigen in the Wassermann reaction, but the accuracy of the serodiagnosis of syphilis remained at the same unsatisfactory level as compared with the results obtained with the beef heart extract antigens in common use. The lipoid properties of the treponema pallidum appears to be similar to that of the tissue lipoid employed in the serology of syphilis since the lipoid of that organism constantly gives rise to a substance with affinity for the lipoid contained in alcoholic tissue extracts. The tissue extract reactions may, therefore, be conceived of as fundamentally specific manifestations.

In vivo experiments with flocculate of syphilitic rabbit serum, consisting of the antibody and the tissue lipoid combined, also indicate that the reinforced beef heart antigen is basically specific. Inoculations of such floccules are capable of inducing identical antibodies in animals of the same species.[7] The necessity of foreign protein in that mechanism, exemplified by inducing antibodies in rabbits to flocculate of human syphilitic serum suspended in saline,[7] is therefore ruled out since the formation of antibody with affinity for lipoid antigen is not dependent on the presence of protein or antibody from an animal of a different species. The fact that syphilitic serum under no circumstances by itself is capable of inducing antisyphilitic substances when intravenously injected, does not prove the absence of specific antibody. The physical state of the antigen is important in other forms of immunity as evidenced by the formation of antibodies such as anaphylactins, precipitins, and agglutinins where soluble and particulate antigens respectively are required for typical results.

Both syphilitic serum and the emulsion of tissue lipoid extract, when singly injected into rabbits, fail to induce an antibody with the capacity of reacting in vitro with beef heart lipoid antigen. On the other hand, when the emulsified lipoid is injected together with certain proteins of a different species, or if syphilitic antibody is attached to the lipoid emulsion particles, an antibody is formed when such material is intravenously injected into rabbits. The various routine tests for syphilis show positive reactions when applied to the serum of the inoculated animals, but the differential test described by the author[8,9] classifies such reactions as nonsyphilitic manifestations. When flocculate of positive differential tests, obtained in patients with clinical syphilis, is inoculated intravenously into rabbits, the animals develop both positive routine tests for syphilis and positive differential reactions. These facts illustrate to some extent the nature of both specific and nonspecific serologic tests for syphilis and point to the serum protein as a source of false positive reactions.

Cause and Extent of Nonspecific Syphilis Tests

Certain serologic similarities present themselves in syphilitic and in tuberculous infections. In the serology of tuberculosis, the x-ray and cutaneous tests have revealed flaws both in regard to specificity and to sensitivity. It is now generally agreed among numerous investigators that complement fixation methods in the serodiagnosis of tuberculosis show false positive reactions to the extent of from 15 to 20 per cent, and that such reactions fail to detect the infection in about

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30 per cent of all tuberculous patients tested. In syphilitic infection, the most sensitive flocculation methods in the serodiagnosis of that disease exhibit greater sensitivity and are capable of detecting about 95 per cent of syphilitic infections. According to the latest conceptions of specificity in the serology of syphilis, we are, most likely, not much nearer reality than in the case of tuberculosis. Lately, official serologic evaluation committees have contributed greatly to the uncovering of weak links in the serology of syphilis. The several serologic methods in more or less general use vary greatly in sensitivity and in simplicity of performance, but to establish the difference in specificity when the various tests are applied to all types of disease, becomes a hair-splitting and insignificant proposition in comparison with the greater number of false positive reactions by all tests.

Possible fundamental causes of false positive reactions in the serology of syphilis have been discussed in a previous publication.[9] The various protein fractions, according to Sörensen,[6] are unstable and transmutable entities. Under certain circumstances, albumin may be transformed into globulin, part of which appears closely related to antibody, and the affinity of both factors for cholesterol reinforced lipoid antigen appears to be increased by heating the serum at 56°C. or at a higher temperature. Infectious diseases other than syphilis may in various ways influence the normal relation between the different fractions of the serum protein and thereby increase the liability of false positive serologic reactions. It has been shown that bacterial contamination of the serum samples may cause nonspecific syphilis tests.[8] Most likely, certain forms of nonsyphilitic infection produce antisubstances with affinity for the antigen of syphilis tests.

The League of Nation's health organization[4] has pointed out a number of nonsyphilitic conditions which may cause false positive syphilis tests, and Krag[3] has demonstrated strong reactions in a number of nonsyphilitic diseases. The following disorders may be listed as possible causes of nonspecific syphilis reactions: leprosy, malaria, infectious mononucleosis, tuberculosis, scabies, psoriasis, acne, Vincent's angina, measles, pneumonia, bronchitis, cerebral hemorrhage, epilepsy, rat-bite fever, respiratory infections, lead poisoning, pregnancy, bone fracture, headache, diabetis, et cetera. In absolute health, especially in young individuals, false positive syphilis reactions are seldom observed.

There are strong indications that the arsenical compounds used in the treatment of syphilis contribute to misleading serologic findings. It is common knowledge in the field of serology that certain patients, treated for a long period of time, become "Wassermann-fast" at the point of weakly positive serologic tests and show negative reactions after discontinuation of the treatment; in some treated syphilitics, the serology remains positive indefinitely. It has been observed by this author that a considerable number of individuals, classified as having latent syphilis on the strength of positive routine tests, are several years later designated as being in a serology-fast state. In such cases, the differential test is usually found negative.

In the presence of tertiary syphilitic lesions, the cause of negative syphilis tests may possibly be found in antibody absorption by antigenic material of the blood stream. In cases with syphilitic aneurysm, routine tests have been found negative although post mortem examinations have revealed active syphilitic lesions. In those instances, the differential test has been positive. In cardiac cases, the blood sample for the differential reaction should be drawn before the administration of digitalis since that substance seems to interfere with the protein-antibody relation to the copper sulphate employed in that method and this may cause false negative reaction. The ingestion of alcohol by syphilitic individuals has the same effect, especially in individuals with neurosyphilis.

The relation between the antibody of the serum and that of the spinal fluid in individuals with neurosyphilis has been discussed in a publication now in press.[9] It appears that in certain cases with that form of syphilitic infection, degenerated cell material may pass from the spinal canal to the blood stream and cause positive blood reaction of the same nature and by a similar mechanism as the reactions induced by species specific flocculate in the rabbit.[7] On that basis it would be explainable why some neurosyphilitic patients without the involvement of other organs fail to show positive blood tests at that stage of the infection. For some obscure reason, immune substances may in such cases fail to reach the blood stream. It would seem improbable that negative blood reactions in patients with neurosyph-

ilis could be due to the absorption by antigenic material from the spinal canal as long as the spinal fluid shows positive serologic tests for syphilis.

er or longer periods of time. The technic was adjusted accordingly by sensitizing the alcoholic beef heart extract antigens by the addition of another lipoid in the form of cholesterol. Other

TABLE I.—GAEHTGENS PALLIDA REACTION COMPARED TO OTHER METHODS IN 1606, PRESUMABLY NONSYPHILITIC INDIVIDUALS*

Method	Number Samples Negative	Number Samples Positive	Number Samples Doubtful	Per Cent Positive Results	Per Cent Doubtful Results	Total Per Cent Positive Results
Pallida†	1587	10	9	0.6	0.6	1.2
Kahn	1590	7	9	0.4	0.6	1.0
Kline	1587	8	11	0.5	0.7	1.2
Rytz	1586	16	4	1.0	0.3	1.3
Meinicke	1580	9	17	0.6	1.1	1.7
Muller	1571	18	17	1.1	1.1	2.2

*From Th. M. Vogelsang: Sero-Diagnostic de la Syphilis. J. W. Eides Boktrykkeri, Bergen, 1940.
†Complement fixation method employing Gaehtgens treponema pallida antigen.

TABLE II.—GAEHTGENS PALLIDA REACTION COMPARED TO OTHER METHODS IN 544 PATIENTS GIVEN ANTISYPHILITIC TREATMENT*

Method	Number Samples Positive	Number Samples Doubtful	Number Samples Negative	Per Cent Positive Tests	Per Cent Doubtful Tests	Per Cent Positive and Doubtful Tests
Pallida†	349	15	180	64.1	2.8	66.9
Kahn	288	52	212	51.5	9.6	66.1
Kline	298	57	189	54.8	10.5	65.3
Rytz	315	21	208	57.9	3.9	61.8
Meinicke	324	45	175	59.6	8.3	67.9
Muller	316	30	198	58.1	5.5	63.6

*From Th. M. Vogelsang: Sero-Diagnostic de la Syphilis. J. W. Eides Boktrykkeri, Bergen, 1940.
†Complement fixation method employing Gaehtgens treponema pallida antigen.

Variation in Serologic Procedure

The Wassermann reaction, based on complex immunologic factors, has been the nucleus around which other serologic methods in the serology of syphilis have developed. For the standardization of the complement fixation method, the clinical diagnosis has served as a sound basis. But it was soon observed that the Wassermann test failed to show positive reactions in some cases with both a history and clinical findings of syphilitic infection, especially in patients given anti-syphilitic treatment for short-

sensitization efforts, such as ice box incubation, were attempted with some success. At the same time, doubt was cast on some of the positive results obtained by the changed technic, and the lack of sensitivity during the early period of treatment became an established fact. In attempting to increase the diagnostic value, modifications of the Wassermann reaction became innumerable, but none of the procedures were capable of doing justice to either the patient or the physician.

The flocculation methods constitute simpler and more direct methods of testing, and, as point-

ed out above, the most sensitive of these procedures leave but small percentage unrecognized of syphilitic individuals tested. On the other hand, the number of false positive tests are relatively large both by the flocculation and the complement fixation method. The former procedure appears to show more post-cure positive reactions due to the influence of arsenical compounds on the stability of the serum protein as evidenced by the number of serology-fast cases and by the results obtained by the differential test after elimination of the serum protein.

Aside from certain fundamental immunologic principles, general rules are few or nonexistent in the design of serologic procedure. A standard antigen, for example, to be used in the different methods of testing for syphilitic infection, appears to be an impossibility. If one factor of the technic is changed, other phases must be adjusted accordingly. However, in considering technical details of the various methods, one common aspect appears discernible; a sensitive, and at the same time rapid method, must take into its service some form of physical force, such as shaking or centrifugation, in the process of antigen-antibody combination, in order to avoid employment of a hypersensitive antigen which in turn will result in an excess of false positive reactions. If the sensitivity factor of a rapid test depends entirely on the antigen, nonspecific reactions will be too conspicuous. Some of the sensitive, rapid slide methods will illustrate that point. In absolute health such methods may or may not be found reliable in comparison with other tests, but if applied to the various forms of disease encountered in routine work, those procedures will prove unsatisfactory. The post-cure positive serologic tests appear to be excessive. If the time element of performance is left out of consideration, a moderately sensitive antigen may serve a sensitive method without showing excessive numbers of nonspecific reactions.

Unsatisfactory Antigen as a Source of Misleading Serologic Reactions

In obtaining satisfactory results in the serodiagnosis of syphilis, the preparation of the antigen is of great importance. The technicalities involved in the preparatory measures are as practicable as any phase of the test itself and should preferably be managed by the individual laboratory since the age of the antigen is significant. The Rytz antigens[8,10] are not fully satisfactory for more than six months after the date of preparation. The age of the beef heart powder employed also plays a major rôle in the quality of the finished antigen. If such material has been kept in stock for many months before extraction, the final product will prove to be of inferior quality. The cholesterol crystals should be tightly sealed and kept in ice box temperature until dissolved in absolute ethyl alcohol. In solution, the cholesterol will remain stable for an indefinite period of time. If the antigen has lost its potency or titer due to too long storage, the lost qualities are irrestorable and the antigen will tend to give both false positive and false negative reactions in the same manner as an antigen designed for a certain method will prove unreliable in other procedures.

Although it is desirable for satisfactory results that the individual laboratory prepare the antigen for the serologic tests employed, it cannot be anticipated that such efforts will be general in the near future. As a step toward more uniform results in the performance of routine presumptive tests for syphilis, it would seem practicable that the public health laboratories of the various states, in collaboration with the authors of the tests currently used, manufacture and distribute the antigen required in public and private laboratories in the respective districts. In connection with standing state serologic evaluation committees, such a measure would be another constructive step toward more uniformity of the results in routine serology.

Method of Differentiating Between Specific and False Positive Syphilis Tests

There are strong indications, as pointed out above, that the various factors of protein liability constitute the main cause of misleading results in the serology of syphilis. By the methods ordinarily employed in precipitating serum globulin, the antibody of immune serum is also removed or rendered serologically impotent by the chemicals used in strong solution. It has been demonstrated[8,9] that a highly diluted copper sulphate, such as a 2 per cent solution when employed as a precipitant, leaves the reacting substance of syphilitic serum in solution while the bulk of serum protein is removed by precipitation. The total amount of protein or protein-like substances left in solution ranges from approx-

imately 100 to 250 mg. per 100 c.c. of supernatant fluid as estimated by the ordinary quantitative tests for serum protein. If a few serum samples from syphilitic and nonsyphilitic individuals are separately pooled and the serum protein precipitated by a 2 per cent copper sulphate solution, the diluted[8] supernatant fluid of the syphilitic serum will uniformly show a higher protein content than the pooled serum from nonsyphilitics. On the other hand, if serum samples from syphilitic patients are singularly tested by the same method, an occasional serum will show a supernatant fluid with a protein content as low as 50 to 100 mg. per 100 c.c., which is the average amount of protein in the supernatant fluid of normal serum. However, the amount of protein left in solution has no bearing on the differential reaction. The specific reacting substance of syphilitic serum apparently unites with the copper sulphate of the supernatant fluid and thus is available in sensitized form for a properly adjusted serologic flocculation method.[9]

The results obtained by the differential test in syphilitic rabbits and in animals showing false positive syphilis reactions, and also the findings by that method in comparatively large groups of human beings, have been described.[8,9] The differential test was privately applied to samples recently submitted to this laboratory by the Minnesota state serologic evaluation committee.[5] Of ninety-nine blood samples from patients with a clinical diagnosis of syphilis or from patients with positive routine presumptive tests for that disease, seventy proved to have positive differential tests. That group had been treated on an average of one and one-half years; of the remaining twenty-nine blood samples from presumably syphilitic donors, twenty had been treated averagely for two and one-half years and showed more or less positive routine Rytz and Kahn reactions, but the differential tests were negative as indicated in Table III. The remaining nine donors had negative routine Rytz and Kahn reactions and the differential test was therefore not applied.

In 3,100 individuals presenting themselves as blood donors, thirty-two were found to have positive routine Rytz and Kahn reactions; twenty-five of that group showed positive differential tests, and the majority gave a history of primary or secondary syphilitic lesions. The seven cases

TABLE III.—DIFFERENTIAL TEST COMPARED TO ROUTINE SEROLOGY IN NINETY-NINE PATIENTS GIVEN ANTISYPHILITIC TREATMENT

Case Classification	Number of Patients	Average Treatment (Years)	Routine Rytz or Kahn	Rytz† Diff. Test	Wassermann Reaction
Various forms of syphilitic infection	70	1.5	pos.	pos.	pos. in 49
Neurosyphilis	12	2.5	pos.	neg.	pos. in 11 dbt. in 9
Latent syphilis	4	2.7	pos.	neg.	
Cardiovascular syphilis	2	2.5	pos.	neg.	
Other forms of syphilis	3	2.5	doubt	neg.	
Other forms of syphilis	8	2.4	neg.		

*Tabulated from data obtained from the Minnesota state serologic evaluation committee on samples submitted to this laboratory during the Minnesota state serologic conference of 1940.
†The differential test was performed (but not reported to the committee) on all samples showing positive routine Rytz, Kahn or Wassermann tests.

TABLE IV.—DIFFERENTIAL TEST COMPARED TO THE ROUTINE RYTZ AND KAHN TESTS IN 3100 INDIVIDUALS PRESENTING THEMSELVES AS BLOOD DONORS

Number of Blood Donors	Routine Rytz & Kahn Positive	Per Cent Routine Serology Positive	Rytz Diff. Test Positive	Rytz Diff. Test Neg.	Per Cent Diff. Test Neg.
3100	32	1	25	7*	22

*The donors with negative differential tests had no history of syphilitic infection and were also found to be without clinical symptoms of that disease. The routine serology in that group was weakly positive.

with negative differential tests had weakly positive routine Rytz and Kahn reactions and none revealed a syphilitic history.

Comment

The "routine" tests commonly used in the detection of syphilitic infection may continue to serve as valuable and simple presumptive measures in connection with more exacting diagnostic reactions in the form of differential or verification tests. The differential test described by this author[8,9] should not be conceived of as a single, sure instrument in the serodiagnosis of syphilis. Its application is intended only in case the presumptive reactions are positive or in the few instances where such tests are negative and the clinical picture is indicative of syphilis. The wider use of the differential reaction is partly prevented by the fact that it requires clear serum, free of hemoglobin or other excessive pigmentations. As pointed out above, it is equally important that the patient has not been under the influence of alcohol for several days prior to the blood examination, and that digitalis has not been administered.

In consideration of recent developments in the serology of syphilis and the increasing cautiousness among clinicians, the future serodiagnosis of syphilis will undoubtedly call for considerably more time than the past has allotted for that purpose. The newer form of serology requires repeated and continuous laboratory study for shorter or longer periods of time depending on the clinical findings. From a serologic point of view, the first blood sample may not be found satisfactory. Neither the result of the routine tests nor the differential reaction should be definitely interpreted on the basis of a single examination.

The reports of official serologic evaluation committees indicate that serologic technic in the average clinical laboratory as yet is in the process of development. The serologic laboratory of the near future will undoubtedly demand more thorough training of its technical workers in order to meet new and exacting demands in connection with the general campaign against syphilis. It is in the interest of social security that that infection and similar diseases are arrested, but it is in the interest of social justice that as few as possible are subjected to a hasty and incorrect diagnosis based on misleading serologic findings. Serologic reactions and the "human element" of performance can never be perfect, but the responsible serologist must at least possess the same degree of infallibility as the originator of the test which he is performing. Differential and verification tests may still be in the experimental stage, but on the basis of the results obtained in several thousand cases, there is fair reason for the clinician in charge to withhold a final diagnosis of latent syphilis in cases with negative differential tests and no other indication of the infection than a positive "routine" serologic test for syphilis.

Summary

The fundamental principles of the serology of syphilis have been discussed and it has been pointed out that the use of spirochetal antigen in the serodiagnosis of syphilis is no safeguard against the occurrence of false positive reactions. The cause of nonspecific reactions appears traceable to the unstable nature of the various fractions of the serum protein. In certain cases, the arsenical compounds employed in the treatment of syphilitic infection seem to contribute to the general unreliability of routine tests in the serodiagnosis of that disease.

The difference in reliability of the various routine tests for syphilis appears to be relatively slight in comparison with the general unreliability of all the so-called routine tests.

In employing the differential test in all cases with positive routine or presumptive reactions, the final interpretation of the serodiagnosis of syphilis appears to be in closer harmony with the clinical findings.

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MARIE'S HEREDITARY CEREBELLAR ATAXIA (OLIVOPONTOCEREBELLAR ATROPHY)*

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HEREDITARY ataxia was first described by Friedreich[10] in 1861 at the congress of German naturalists and physicians at Speyer. Two years later he further set forth the disorder in an account of six cases in two families affected with a "degenerative atrophy of the spinal posterior columns," stated it was a new disease, and distinct from the usual type of Duchenne's locomotor ataxy. In 1876 he gave the condition the name of "hereditary ataxia." Nevertheless all other writers of those times considered it as a hereditary or juvenile form of tabes, or of multiple sclerosis, or a combination of the two. Finally in 1882 Brousse[5] agreed that hereditary ataxia was an entity and proposed the term "Friedreich's ataxia." Since then Friedreich's ataxia (hereditary spinal ataxia) has been established as a degenerative heredofamilial disease involving the nuclei dorsalis (Clarke's columns), the posterior and lateral columns of the spinal cord, and the posterior rootlets. The classical clinical syndrome customarily appears before puberty and includes ataxia of skeletal musculatures, nystagmus, kyphoscoliosis, and foot deformity.

Considerable variation in symptoms occurs between different families affected with Friedreich's ataxia. A particular family disease type (genotype) is said to characterize the condition. However, variations also appear between different members of any affected family. Intermediate, incomplete, aberrant, or transitional forms of hereditary ataxia have long been recognized. The classical syndrome of Friedreich's disease thus may veer toward any one of the various myelopathic, neurotic, or myopathic hereditary conditions. A clinical and pathological study of Friedreich's ataxia reported by Baker[1] showed spinal cord, peripheral nerve, and skeletal muscle degeneration all in one patient.

In 1893 Marie[15] reviewed sixteen cases in which the symptoms he thought did not exactly belong in the Friedreich's ataxia entity. Necropsy data were present in only two of these cases. This new clinical syndrome, which he ascribed to a congenital defect or arrest of development of the cerebellum, Marie termed "hereditary cerebellar ataxia."

Marie's concept was evolved from these sixteen "abnormal cases" of Friedreich's ataxia noteworthy among which was the report by Brown[6] in 1892. This latter report concerned twenty-one affected members of a family over five generations with age of onset from sixteen to thirty-five years. These patients showed clinical signs of cranial nerve involvement such as Argyll Robertson pupils, optic atrophy, ptosis, and diplopia. They did not have nystagmus or foot deformity. Pathologically there were morbid changes in the cerebellum which were restricted largely to the Purkinje cells and olivary bodies. Also, as in Friedreich's ataxia, in the spinal cord the posterior columns, Clarke's columns (nuclei dorsalis), and Flechsig's (dorsal) direct spinocerebellar tracts were markedly involved and the pyramidal tracts were slightly involved.

Although he created the term "hereditary cerebellar ataxia," Marie conceded transitional forms between that disorder and Friedreich's ataxia could occur and thus the one or the other affection might be different modalities of the same morbid process. Wilson[19] states that claim to clinical independence for Marie's hereditary cerebellar ataxia rests upon its onset in adult years and consequently more definite hereditary character (as opposed to early onset and familial aspects in Friedreich's ataxia), persistence or exaggeration of deep reflexes (as contrasted to their decrease or loss in Friedreich's ataxia), and frequently associated optic atrophy and ocular paresis.

In 1900 Dejerine and Thomas[9] described the pathology in a degenerative disorder which they named olivopontocerebellar atrophy but they said

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it was neither a familial nor a hereditary condition. Holmes[12] in 1907 described a form of familial degeneration of the cerebellum and asserted that a majority of cases of progressive cerebellar disease belongs to the class of olivopontocerebellar atrophy. The pathological report in his paper was based upon the examination of the central nervous system of one of four siblings affected in this particular family. Grossly, the cerebellum, pons, and medulla were very atrophic. Microscopically, the specimen showed atrophy and outfall of Purkinje cells, rarefaction and reduction of the molecular and granular layers, some degeneration of fibers in the folia and central white matter, sclerosis of the inferior olives, and disappearance of the olivocerebellar tracts. It did not show any involvement of the pontile nuclei or pontocerebellar contingents. Holmes'[12] case therefore represents, strictly speaking, olivocerebellar atrophy which, however, is probably only an incomplete form of olivopontocerebellar atrophy.

Davison and Wechsler[8] held that olivopontocerebellar atrophy may be differentiated from Marie's hereditary cerebellar ataxia both clinically and histologically. They said the hereditary or familial character is more constant in the ataxia, while the ocular manifestations, such as optic atrophy and ocular palsies, are more common in the atrophy group. They also said although there is destruction of the Purkinje cells in the ataxia, the moss and climbing fibers (cerebellipetal elements) may be spared whereas in the atrophy group the olives, pons, and cerebellum together with its various cerebellipetal elements are all more or less affected, while the Purkinje cells, and inferentially the cerebellifugal elements, are only affected in the later stages of the atrophy. These authors reported an illustrative case of olivopontocerebellar atrophy with the additional involvement of the dentate nuclei and also the unusual associated phenomenon of involvement of cranial nerve nuclei, namely, the right third to tenth inclusive.

However, Hassin and Harris[11] are authority for the now generally accepted opinion that Marie's hereditary cerebellar ataxia and olivopontocerebellar atrophy are one and the same disease process. The atrophy was shown to be a heredofamilial degeneration by these authors, by Keiller,[13] and by Yang et al.[20] Waggoner and co-workers[18] reported a case of hereditary cerebellar ataxia and a genetic study of the individual's family. Dejerine and Thomas[9] forty years ago first described the principal and still recognized pathological features of olivopontocerebellar atrophy as including atrophy of the cerebellar cortex, bulbar olives and pontile gray matter, degeneration of the middle cerebellar peduncles (brachia pontis) and of the inferior cerebellar peduncles (corpora restiforme) with relative integrity of the central nuclei (dentate and other cerebellar roof nuclei, emboliformis, tecti and globosus). The clinical syndrome is clearly and characteristically cerebellar in nature, with onset in adult life. Occasional symptoms, incompatible with only olivary, pontile, or cerebellar pathology, are (1) urinary disturbances such as retention, automatic bladder, and incontinence which might arise from destruction of the visceral afferent ganglion cells in Clarke's columns (nuclei dorsalis) of the spinal cord, and (2) psychical symptoms such as impairment of sensorium and intellect indicating cerebral involvement.

The most common types of degeneration of the cerebellum are olivopontocerebellar atrophy and parenchymatous cortical cerebellar atrophy. In the former the atrophic degenerative changes are in the medullary (bulbar) olives, the basal (ventral) portion of the pons, and the white substance of the cerebellar lamellae. The tract degeneration involves the afferent fibres of the cerebellum (cerebellipetal fibers). The changes in the cerebellum are secondary to those in the medulla and pons. The ganglion cells of the cerebellar cortex may be spared or there may be transsynaptic degeneration of the cortex. In parenchymatous cortical cerebellar atrophy the primary changes are in the ganglion cells of the granular layer (Purkinje, granular, basket, and large and small stellate cells) and the degeneration involves their axones. The degeneration of the Purkinje cell efferent (cerebellifugal) axones causes transsynaptic degeneration of the cells in the dentate nuclei which in turn affects the other cerebellifugal tracts and produces atrophy of the superior cerebellar peduncles (brachia conjunctivum). Thus the process may extend to the nuclei ruber in the midbrain and even beyond to the thalamus and cerebral cortex. The loss of the cell bodies in the granular layer and their dendritic processes in the molecular layer is the basis of parenchymatous cortical cerebellar atrophy. Richter[17] reported a familial instance of

parenchymatous cortical cerebellar atrophy in which the ratio of the weight of the cerebellum and brain stem (130 grams) to the total brain weight was 1:19, whereas normally the ratio is 1:6 or 1:7 (normal cerebellum and brain stem weight 155 to 180 grams). However, as shown by Kirschbaum and Eichholz,[14] there is not always gross atrophy of the olives and cerebellum. Histological examination is the only certain method of proof of this degenerative disorder. According to Parker and Kernohan[16] the onset is generally in the later adult years and in their review of twelve cases there was no history of familial incidence.

In summary, it is now recognized that there are many variants of spinal and cerebellar ataxia incident to heredofamilial degenerations. The degenerations are primary, and variously referred to as an abiotrophy (Gowers), a premature senescence (Raymond), a pathoklyse (Vogt), or a defect of vital endurance. No etiological factor other than a genetic error has been demonstrated. There are three fairly distinct clinical and pathological entities, namely, Friedreich's ataxia (hereditary spinal ataxia), Marie's hereditary cerebellar ataxia (olivopontocerebellar atrophy), and parenchymatous cortical cerebellar atrophy. The individual and his family reported in this paper illustrate the classical hereditary, clinical, and pathological characteristics of Marie's cerebellar ataxia (olivopontocerebellar atrophy).

Case Report

B. W. S., U. H. No. 631249, whose position in this family is indicated by the arrow in generation IV of the genealogical chart (Fig. 1), was examined in September, 1934. He was twenty-five years old, single, and employed on his mother's farm. Her health had always been good. His father died in 1918, at the age of thirty-three years, the cause of death being given as locomotor ataxia. His paternal great-grandfather, paternal grandmother, three paternal uncles, three paternal aunts, and four cousins died of a similar neurological disorder. His oldest sister, four cousins, and one second cousin were currently likewise affected and four other cousins probably affected.

His medical history except for his presenting complaints was negative. He was a total abstainer from tobacco and alcohol. He graduated from the eighth grade, country school, at the age of thirteen years and thereafter continued to live and work on the home farm. However, a slowly progressive ataxia was gradually incapacitating him and therefore, in company with several of his cousins, some of whom were similarly affected and others not affected, he came to the University of Minnesota Hospitals for diagnosis and medical attention.

About five years previously he first noticed difficulty in walking, writing, and talking. Locomotion was particularly troublesome in the dark; if he closed his eyes he would have to shuffle and grope his way. His writing was becoming laborious and rather illegible. He could not button his clothes easily. He was unable to play ball as he once did since he could not run or judge direction or distance correctly in throwing the ball. He had developed some apparent prominence of his eyeballs but his vision was unimpaired. There were no symptoms or signs of any type of aphasia. He spoke with some hesitancy and the words would tend to run together, to be indistinct or slurred. He felt well in all respects except as incident to the ataxia. His difficulties varied somewhat, some days being worse than others.

Physical Examination.—The patient had a medium figure and medium frame. His temperature was 98.6 degrees F.; pulse 86; blood pressure 128/80; height 70 inches; weight 144 pounds. His eyes had a peculiar staring expression. The frontalis muscles were kept more or less contracted, thereby raising the eyebrows and secondarily the upper eyelids, causing widened lid slits and the appearance of exophthalmus. The routine physical examination was otherwise negative.

Neurological Examination.—The cranial nerves were all normal. The deep reflexes were uniformly increased, 2 plus, and were bilaterally equal. The superficial reflexes and the toe reflexes were normal and there was no clonus. The motor system was normal throughout except as noted in the following paragraph.

The standard finger to finger and finger to nose tests showed definite incoördination. These tests also demonstrated bilaterally a certain degree of asynergia, dysmetria, and cerebellar hypotonus. Asthenia and slowness in muscular contractions and the rebound phenomenon were present and finer movements in general were incoördinate. There was no localizing unilateral cerebellar phenomena such as dysdiadokokinesia, spontaneous deviation, or past pointing. Heel to knee tests showed considerable incoördination bilaterally, somewhat more marked on the left. Asynergia, dysmetria, and cerebellar hypotonus were as evident in the lower as in the upper extremities. Romberg test was positive and the patient's gait was decidedly ataxic.

All forms of superficial and deep sensibility were normal. There was no vasomotor or trophic disturbance. Dysarthria was noticeable; his speech tended to be indistinct as in bulbar or pseudobulbar paralysis. His handwriting was manifestly incoördinate.

Mental status was normal other than for the patient's lack of any great concern about such an obvious disability as he had at the time and the inescapable outcome of the disorder which he knew had been the lot of so many members of his family who had been similarly affected. It was not the attitude of resignation or laissez faire or of well being in the face of

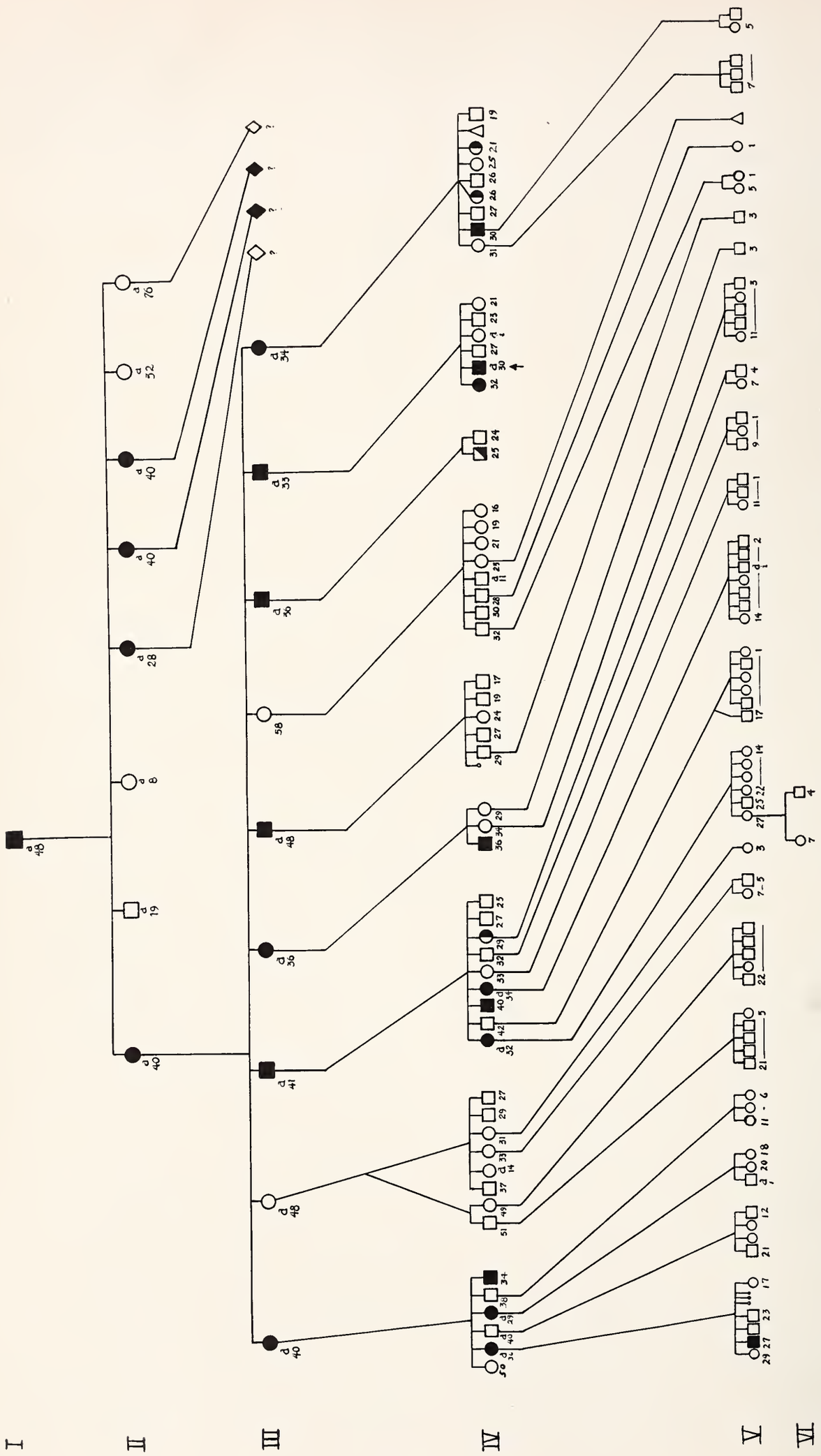


Fig. 1. Genealogical chart of the six generations studied for ataxia. Necropsy in generation IV indicated by arrow. Symbols: ataxic members, solid squares for males and solid circles for females; questionable cases, half solid; generations, Roman numerals; ages in 1939, Arabic numerals, with "d" to indicate death; diamond, families on which data are incomplete.

structural ill health; rather, it seemed to be a dullness of emotion and insight.

Laboratory Examinations.—Urinalysis was negative. The hemoglobin was 78 per cent, leukocytes 7,200 per cu. mm. with neutrophiles 79 and lymphocytes 21 per cent. The blood Wassermann was negative. The basal metabolic rate was plus 11 per cent. The spinal fluid

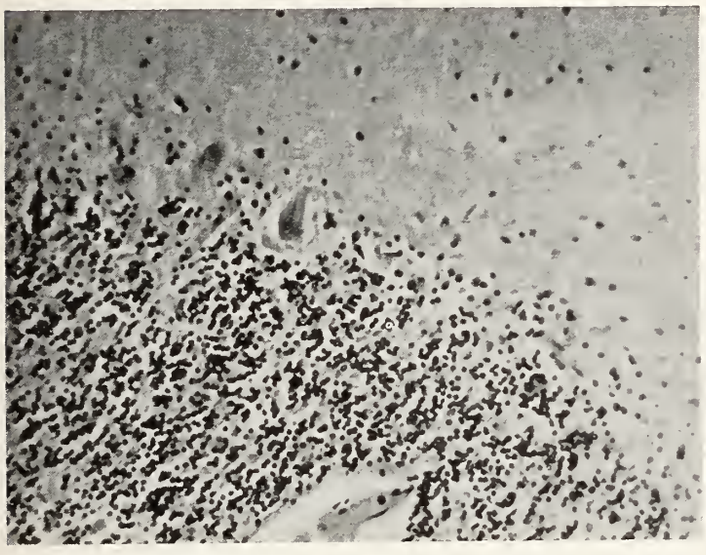


Fig. 2. Cerebellar cortex. Extensive dissolution and disappearance of Purkinje cells. Hemotoxylin-eosin stain. X 300.

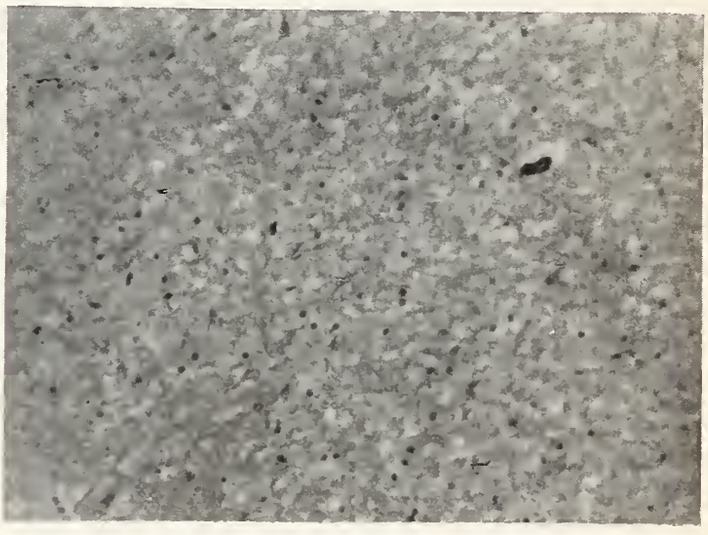


Fig. 3. Brachium pontis. Partial demyelinization and vacuolization. Hemotoxylin-eosin stain. X 300.

was clear and colorless, pressure 8 mm. of mercury, Queckenstedt test produced a rise to 12 mm. on the left and 14 mm. on the right with a prompt return to 8 mm. on either side, cells none, Nonne negative, Wassermann negative, colloidal gold curve 1221111111.

A diagnosis of Marie's hereditary cerebellar ataxia (olivopontocerebellar atrophy) was made on the purely cerebellar neurological findings, the onset in adult life, and the definite hereditary character of the disorder.

Following his hospital study the patient returned o his home and continued with his farm work. The ataxia and attendant disability gradually progressed. He became bedridden about three months before his death in March, 1939. The terminal condition was reported as being bulbar in nature with laryngeal paralysis, difficulty in breathing and finally bronchopneumonia.

Necropsy Report.—Gross examination of the brain revealed the external surface to be essentially negative. The cerebellum appeared to be somewhat decreased in size. The olives were flattened and much smaller than normal. This was especially so on the right where only an irregular shriveled protuberance marked the location of that structure.

All the microscopic sections were stained with hemotoxlyn-eosin, azocarmine, Bielschowsky's silver, and Weigert's myelin sheath stains.

Sections of the cerebral hemispheres and midbrain and peduncles showed no abnormality. The cortical cells were intact. There was no apparent involvement of any part of these structures.

Sections of the cerebellum showed a diffuse but patchy lamellar degeneration of the white substance. There was a severe destruction of fibers in some areas with a relative increase of glial cells. The white substance in those areas had almost a vacuolated appearance.

Sections of the cerebellum revealed primarily an extensive disappearance of the Purkinje cells (Fig. 2). An estimated two-thirds of these cells had disappeared leaving only about one cell per low power field. Only a few of the cells that did remain had any resemblance to the normal. The cell bodies showed two types of change. Some cells contained pyknotic irregular nuclei, the cell bodies proper being hypochromatic and somewhat shrunken. The other type of change was a loss of tinctorial properties. The cells were moderately swollen, stained very lightly, were usually rounded, and contained no neuclei or at most only small fragments of nuclear tissue. Many of these cells had become shrunken and frayed while others had continued to lose their staining properties and now appeared as very faint outlines of the original structures and could easily be called "ghost cells." The cell processes were few and fragmented. Rarely was a cell seen which had dendritic processes and if so its ramifications within the molecular layer were sparse. Generally those cells whose dendritic processes were still present also had intact nuclei although often their outlines were quite faint and difficult to discern. The granular layer of the cerebellum otherwise appeared to be uninvolved.

Sections through the dentate nuclei indicated that structure had almost disappeared. Only an occasional degenerating nerve cell remained. Those cells were fragmented, hypochromatic, and had few or no cell processes. In some areas there were no cells seen in the location of the dentate nucleus.

Sections through the upper pons showed an almost complete destruction of olivocerebellar fibers, only a few strands of fibers being still visible. Other sections of the pons showed a considerable demyelinization and vacuolization of the brachia conjunctivum (superior cerebellar peduncles) with a lesser involvment of the

brachia pontis (middle cerebellar peduncles) and corpora restiforme (inferior cerebellar peduncles). This is illustrated in Figure 3. The pyramidal system as well as the trapezoid body and lemnisci were intact.

Sections through the upper medulla showed a striking destruction of cells in the olives (Fig. 4). The few cells which they did contain were mostly abnormal in

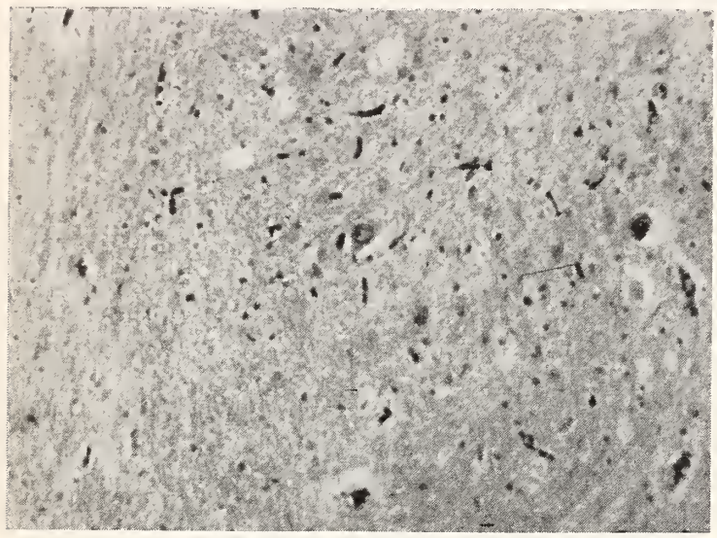


Fig. 4. Medullary olive. Destruction and paucity of nerve celis. Hemotoxylin-eosin stain. X 300.

structure. They showed a fragmentation, shrinking, and loss of tinctorial properties with injury or disappearance of their nuclei and conversion into "ghost cells." Within the hilus of the olives only an occasional fiber was seen. The destruction of the olives was about equal bilaterally.

Sections of the cervical spinal cord showed no involvement of any of the fiber tracts or nerve cells in that portion of the cord and hence, inferentially, there was no involvement in the cord below that level.

Genetics of the Ataxia

A study of the history of ataxia in this family indicates that heredity is involved. Although the severity of the ataxia may be influenced by other circumstances, the actual appearance of the disease in each member seems to depend upon a hereditary basis. The trait has appeared in some members in each of five generations of the family, and has not developed in any person who married into that family.

Genealogy.—The transmission of the ataxia in this family is shown by the accompanying chart (Fig. 1) for which the data have been checked against several sources of information from the family. In the chart, the solid squares represent affected males; the solid circles, affected females. Half-solid squares and circles represent questionable cases. Only the immediate members of the family are shown. Roman numerals indicate the generations. Arabic numerals, given below the individuals, indicate the ages of the members in 1939. In the fifth generation the ages between the lowest and highest are in part omitted. The symbol "d" with a numeral indicates the age at death. A triangle is used for an individual whose sex is unknown; a diamond with "?" for a line of descendants for which data are not complete. Small circles represent stillbirths.

Type of Heredity.—The ataxia seems to be inherited as a Mendelian dominant. Sex-linkage apparently is not involved, since the trait has passed from a father in generation III to a son in the third and also in the eighth families of generation IV. In order to assume that the trait is recessive, sex-linked or Mendelian, it would be necessary to assume that the many individuals who married into the family were carriers, heterozygous, for the trait. The ataxia occurs too infrequently in the general population for such a condition to be true, although Brain[4] and Blacker[2] assume that a common recessive gene acts with a mutant dominant gene for the development of ataxia. The appearance of the trait is not limited or influenced by sex, although, as will be mentioned, the severity may be greater in the female. Of the twenty-three definite cases in the family, twelve occurred in females and eleven in males.

All the data fit the interpretation that in this family the trait is similar to many cases reported, and behaves as a simple Mendelian dominant. Each affected member had one affected parent. The second and sixth members of generation III were not affected and, as is to be expected on the basis of dominance, their children are normal for the trait. Ten or possibly thirteen of the offspring in these two families are of an age at which the symptoms could be recognized. In the case history reported by Brown[6] normal parents do produce affected offspring.

On the basis of dominance, since each ataxic member married a person who was not affected, one-half of his progeny should be affected. Owing to the variations in the age of onset, it is not possible to determine accurately the frequency with which the trait appears. The age of the youngest affected member of the family is twenty-seven years. If his is taken as the crucial age for a definite recognition of the trait and all members who have not reached that age are omitted from the count, the family chart shows that twenty children of ataxic parents are not affected; twenty-two are ataxic; and one is questionable. The observed frequency, 53 per cent, closely approaches the 50 per cent expected. The age of the youngest questionable case in the family is twenty-one years. On the basis of this age, thirty-one children of ataxic parents are not affected, twenty-two are affected, and four are questionable. This frequency, 46 per cent, does not differ greatly from that expected.

In the second generation, four of the six children who lived to the probable age of onset were ataxic. In the third generation, seven of the nine members in the sibship were ataxic. Twenty-five members in generation IV have reached the age of twenty-seven years; ten of these are recorded as ataxic, one as questionable, and fourteen as not affected. Thirteen other children are older than twenty years; three of these are classified as questionable, and ten as not affected. Only three of the fifth generation have reached twenty-seven years, and one of these is ataxic. Four other non-affected members have reached twenty-one years.

Age of Onset.—The ages of onset of the disease are not known for many of the cases. The two cases known in generation III occurred at twenty-one and at thirty-three years. In generation IV, the onset for seven cases (four known for certain) has ranged from ages twenty-one to thirty, with an average age of twenty-four years. The one affected person in generation V developed symptoms at twenty years. In this family, the age of onset seems to be more nearly like that of the report by Blauner,[3] and not as late in life as that reported by Classen[7] or Waggoner et al.[18] The duration of the disease for those who have died has ranged from seven to thirteen years. One exception is to be noted. Member seven of generation III had the disease only three years, but died during the influenza epidemic of 1918.

Anticipation.—The phenomenon of anticipation does not seem to be involved in this genealogy. Due to the scarcity of records concerning the age of onset and the fact that the younger generation is watching for the symptoms and thereby recognizing the disease at an earlier age, the age of onset cannot be used as a means to study the possibility of anticipation.

On the other hand, the age at death of those affected can be used in the interpretation. In generation II, the average age at death of affected members was thirty-seven, with the ages ranging from twenty-eight to forty years. In generation III, the average age was thirty-eight, with the range from thirty-three to forty-eight. years. Records for generation IV give an average age at death of only thirty-two, and a range from twenty-nine to thirty-six years. Although the average in this generation is lower than that of the other two generations, it probably does not offer evidence in support of anticipation. The five living members in generation IV who are certain cases of ataxia have a range of ages from thirty to forty, with an average of thirty-four years. Their average age at death will obviously increase that for the generation; and at present, the range for all certain cases in the generation is equivalent to that for the second generation.

In histories of ataxia, members are usually known to be affected several years before their deaths; consequently, such a history may help to explain the so-called anticipation reported for some hereditary traits which develop late in life. Generation IV in this family gives a misrepresentation in that the average age at time of death, thirty-two years, represents the most severe cases. The milder cases, or else those members whose conditions of life cause the disease to act over a longer period of time, are still alive. Their present average age, thirty-four years, is two years higher than that of the affected members who died. In the final records for the known cases of ataxia of the generation, the increase in the average age will tend to remove any evidence of anticipation. If the disease were of a type which did not have a long duration before death, that explanation for anticipation would not be observable, even though it would still be active.

A Possible Sex Difference.—No condition of life is known which might make the disease more destructive in some members than in others. The ten certain cases in generation IV, however, do offer an interesting possibility. Five of the affected members are alive and five are dead. There are an equal number of affected males and females. Four of the five ataxic members who have died are females, four of the five living ataxic members are males. The average age for the four deceased females is thirty-three; that for the four living males, thirty-five years. Although this circumstance may be merely a matter of chance, records of the family do not so indicate. The results in generation IV are in accordance with the differences observed in generation III, in which the three affected females had an average age at death of thirty-six, the four males, thirty-nine years. It is also of interest that the four affected members of generation II were all females and that their average age at death, thirty-seven, is less than that of generation III, thirty-eight years, which included some males. If all the affected individuals who have died are considered for all generations, the eleven females show an average age of thirty-five, the six males, thirty-nine years. Although the disease is likely to develop in either sex, the female who inherits the defective condition, insofar as we can tell from these records, is likely to die earlier than the affected male. The data on the ages at onset are too scanty for accurate interpretation on variations of the onset.

Eugenic Consideration.—Until some therapeutic means is found to combat the disease, any control of its spread rests with the members of the family. This is not a disease which selects against itself by the elimination of ataxic individuals early in life, before children are produced. The presence of the defect does not seem to decrease the average size of the families. Several ataxic members even in the more recent generations have produced offspring after the onset of the disease.

An individual who had an ataxic parent can help to eliminate the disease from the family if he will regulate the production of his children. He should have no children until he has passed the age of onset for the disease. It is not possible to give an exact age at which a person can consider himself safe from the probability of developing the disease; but with the trait behaving so clearly as a dominant, it is possible to determine an age which can be said to be relatively safe. The age of the youngest known member with ataxia is twenty-seven years. Therefore a person should have no children before his age is twenty-seven years if his parent was ataxic, or if the parent died too early to show the disease. The person probably should wait until he is thirty or even thirty-three years old, the latest known age of onset in the family. If he then does not show the symptoms, he might consider himself as likely to be free from the hereditary defect, but still not necessarily so. If he does show symptoms of the disease and yet produces children, or if he takes a chance and produces children and then develops the disease, he must expect to pass

the disease on the average to one-half of his children. Those individuals whose parents passed the age of thirty-five years without developing the disease, especially if the grand-parents were also clear, probably will not pass the disease to their descendants.

Comment

The clinical diagnosis of olivopontocerebellar atrophy was confirmed by the gross and microscopic examination of the central nervous system. Grossly, the medullary olives and cerebellum were atrophic. Microscopically, there was extensive disappearance of the olives, the olivocerebellar fibers were almost entirely absent, there was demyelinization and vacuolization of the inferior and middle cerebellar peduncles, and lamellar degeneration of the cerebellar white substance was evident. Also, there was practically a total loss of Purkinje cells and the bodies and processes of those cells remaining were in various stages of dissolution, the cells of the dentate nuclei were similarly affected, and there was demyelinization and vacuolization of the superior cerebellar peduncles.

The degenerative changes in the olives, olivocerebellar fibers, inferior and middle cerebellar peduncles, and cerebellar white substance which were present in this case are the picture of olivopontocerebellar atrophy. If the atrophy is of long standing the histological changes may be more extensive. Transsynaptic degeneration may occur and the Purkinje cells, dentate nuclei cells, and superior cerebellar peduncles consequently may in turn be affected. Thus there was histological evidence of olivopontocerebellar atrophy plus secondary rather extensive transsynaptic degeneration in the instant case.

By transsynaptic degeneration, then, olivopontocerebellar atrophy may conceivably assume some of the characteristics of parenchymatous cortical cerebellar atrophy as did the case here reported. However, the latter condition cannot bring about retrograde degeneration of the olives, pons and cerebellipetal fibers. Degeneration of these structures is distinctive only of olivopontocerebellar atrophy. Finally, since there was no involvement of the spinal cord the case did not have the characteristic element of Friedreich's ataxia. Therefore, in addition to its positive histological picture of olivopontocerebellar atrophy, by exclusion it could not represent either parenchymatous cortical cerebellar atrophy or Friedreich's ataxia.

There was no definite destruction of the pontile nuclei in this case. Involvement of these nuclei would be indicated nevertheless by the presence of demyelinization and vacuolization of the middle cerebellar peduncles through which courses the pontocerebellar fibers, the afferent climbing fibers to the Purkinje cells. Also, the arcuate nuclei and the external and internal arcuate fibers seemed intact. Hassin and Harris[11] reported a case of olivopontocerebellar atrophy with involvement of all the cell bands of Essick, that is, the olives, pontile nuclei, and arcuate nuclei. Since these ganglion cell groups have a common origin from the lip of the rhomboid fossa it is tenable that all of the groups might be affected. However, in a primary degenerative process it is quite possible that one of the groups would be spared. The absence of demonstrable destruction of the arcuate elements in the instant case is therefore not material, particularly since otherwise there was complete histological accord with olivopontocerebellar atrophy, both actually and theoretically.

Several other members of this family in generation IV (Fig. 1), cousins of the one reported, have been studied clinically by us. Some had definite neurological findings indicative of olivopontocerebellar atrophy; others were entirely negative neurologically. None had the clinical signs of parenchymatous cortical cerebellar atrophy or Friedreich's ataxia. The members of this family were Christian people with no taint of alcoholism or specific infection and no nervous or mental disorder except the hereditary ataxia. The staring expression and unsteady gait were said to be the first signs of the disorder. In the women the ataxia seemed to appear soon after childbirth or to become more pronounced in those already affected. The terminal stage of the affection was said to be characterized by throat and lung trouble, not by any decrease in mental faculties. Death certificates of eleven deceased members of the family state the cause of death as follows: pneumonia (2), bronchopneumonia (1), lobar pneumonia (2), pulmonary tuberculosis (1), myocarditis (1), tricuspid regurgitation (1), paralysis (1), locomotor ataxia (1), and Marie's hereditary cerebellar ataxia (1).

Summary

1. The majority of the spinal and cerebellar heredofamilial degenerative disorders are not

entities but variants of a primary degenerative process in the central nervous system. There are three fairly distinct clinical and pathological entities, namely Friedreich's ataxia (hereditary spinal ataxia), Marie's hereditary cerebellar ataxia (olivopontocerebellar atrophy), and parenchymatous cortical cerebellar atrophy. By transsynaptic degeneration the second named may overlap the last named type of cerebellar atrophy.

2. A clinical and pathological report of a case of Marie's hereditary cerebellar ataxia (olivopontocerebellar atrophy) and a genetic study of that individual's family through six generations is presented.

3. Heredofamilial degenerative disorders have no known etiological factor other than a genetic error and consequently the current conception is that they can be overcome only through eugenic methods.

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THE USE OF PAREDRINOL TO CORRECT THE FALL IN BLOOD PRESSURE DURING SPINAL ANESTHESIA*

DAVID P. ANDERSON, JR., M.D.

Austin, Minnesota

PAREDRINE and its N-methyl derivative, paredrinol (veritol; racemic parahydroxy-α, N-dimethylphenethylamine), recently introduced synthetic drugs of the epinephrine-ephedrine series, have been used to prevent and correct the fall in blood pressure during spinal anesthesia.[1] The effective pressor action of these drugs and their apparent advantage over other similar drugs prompted us to investigate further the use of paredrinol during spinal anesthesia. Paredrinol, rather than paredrine, was selected because of the wider pharmacologic and clinical background already established for this substance.[2,3] The two drugs, however, produce similar physiologic effects, with but a slight difference in intensity.

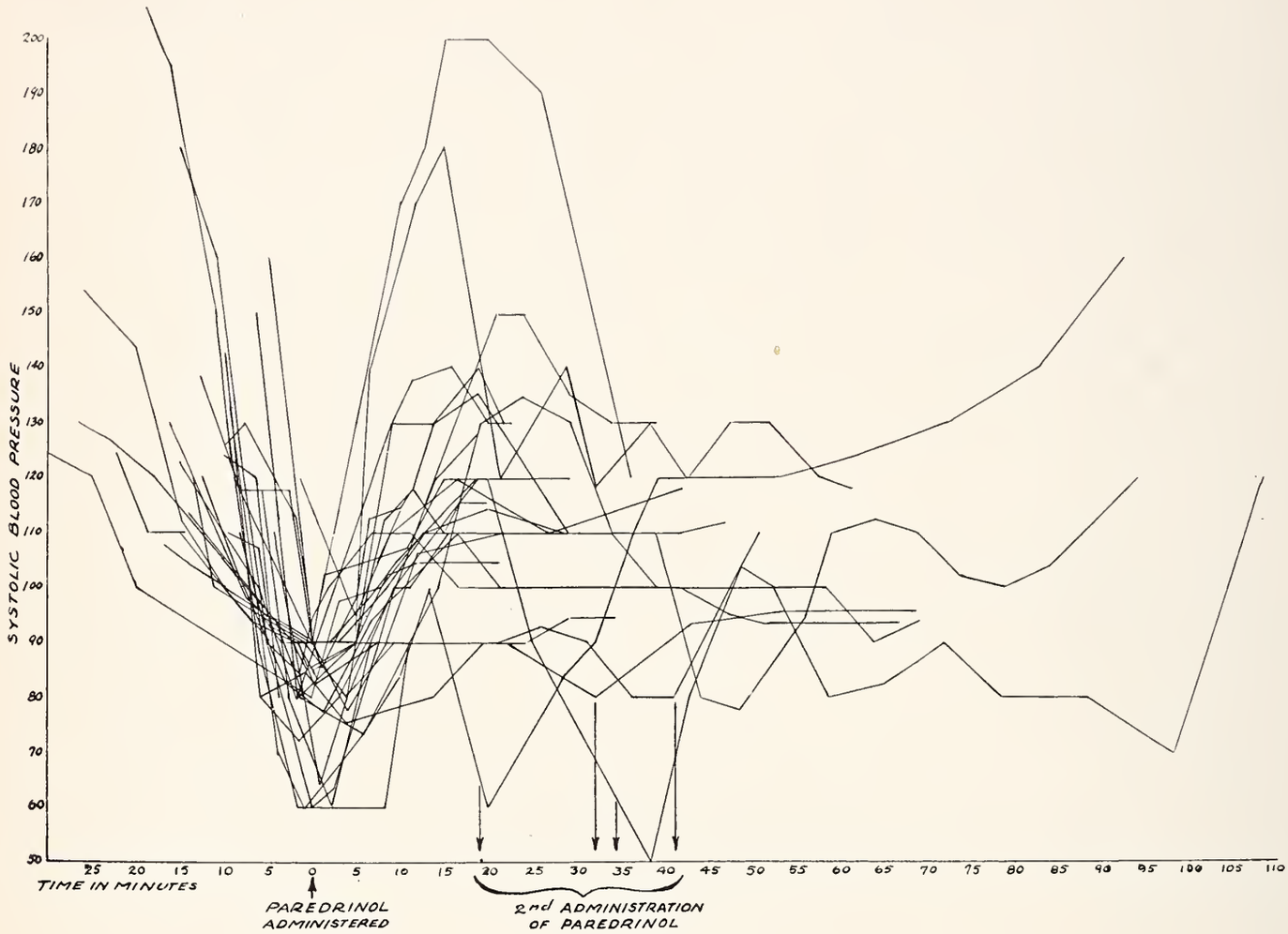
Paredrinol is effective when given by mouth, intramuscularly or intravenously. We have, thus far, employed only the oral and the intramuscular routes of administration, and in this report we shall discuss only those cases in which paredrinol was administered intramuscularly during spinal anesthesia because of a rapid, marked fall in blood pressure. We have used paredrinol to prevent the fall in blood pressure during spinal anesthesia, but a more extensive comparison with other pressor drugs is necessary for definite conclusions.

We have administered paredrinol over a period of four months to thirty-one patients who had a rapid lowering of the blood pressure during spinal anesthesia. This group of patients was given no pre-anesthetic pressor drugs and no atropine. Intravenous fluids were not administered during the course of the anesthetic, except in the two cases where the paredrinol failed to maintain an adequate systolic blood pressure. Paredrinol was given intramuscularly when

*Paredrinol for this investigation was supplied by the Research Department of the Smith, Kline and French Laboratories, Philadelphia.

the systolic blood pressure fell below 90 mm. mercury, and the administration was repeated if a secondary fall in pressure occurred or if there was an inadequate response to the first injection. to maintain an adequate systolic blood pressure.

Paredrinol, even when repeated, was ineffectual in correcting the blood pressure fall in two of the thirty-one cases. One patient was a woman, aged sixty-five, who had a carcinoma of the common hepatic duct. A prolonged exploration was required to establish the diagnosis, the amount of the anesthetic drug was much larger than usual, and the patient's general condition was not satisfactory prior to the operation. The other patient was a man, also aged sixty-five years, with a perforation of the gall bladder. In each of these cases the blood pressure was restored to a satisfactory level by the administration of intravenous fluids. The experience in these cases forced us to return to our former practice of administering intravenous fluids or whole blood transfusions during the course of the operation in critically ill patients requiring extensive surgical procedures under spinal anesthesia. The fact that paredrinol alone will not maintain an adequate blood pressure in such cases is not surprising in view of the experimental observations of Stead, Kunkel and Weiss



The usual intramuscular dose of paredrinol was 20 mgm. An initial injection of 40 mgm. of paredrinol was given in an early case, a woman of forty-eight years who had a pre-anesthetic systolic blood pressure of 154 mm. mercury, and a rapid rise of the systolic blood pressure from 90 to 200 mm. mercury was noted. The 20 mgm. initial dose was adopted as a routine because of the untoward effects of the larger dose in this case, and in elderly or arteriosclerotic patients an initial dose of only 10 mgm. was frequently used.

The initial dose of paredrinol was sufficient to correct the fall in blood pressure and to maintain a satisfactory systolic blood pressure above 100 mm. mercury in twenty-three of the thirty-one cases. A single administration of the drug was sufficient to maintain a normally low systolic blood pressure in two additional cases. In four of the thirty-one cases, a second administration of paredrinol (10 to 20 mgm.) was required

on the mode of action of paredrinol.[3] The drug is not of value in all types of syncope and it is particularly unlikely to be of benefit in cases of shock from fluid loss.

There were no operative or hospital deaths in this series of cases, nor were there any postoperative complications which could be attributed to the anesthetic. No untoward symptoms resulted from the administration of paredrinol, except the transient hypertension noted in an early case. There was a striking absence of marked stimulating effects on the cortical centers, which frequently occur with other pressor drugs. Cardiac arrhythmias and marked tachycardia did not occur.

Conclusions

Paredrinol, a synthetic pressor drug of the epinephrine-ephedrine series, is effective in correcting the blood pressure fall during spinal anesthesia. This drug possesses certain advantages over other pressor drugs in that it does not cause excessive cortical stimulation, tachycardia, or cardiac arrhythmia. We feel that further clinical investigation of paredrinol is indicated.

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CASE REPORTS

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL
Frank C. Andrus, Pathologist

A white woman, forty-one years of age at the time of death, was first seen at the hospital in August, 1934, when she was thirty-five years of age. She complained of attacks of nervousness, headache, palpitation of the heart, vomiting, and tremor of the hands. With these attacks of palpitation, she became extremely weak and pale. She did not faint. The attacks came on with equal frequency during the day or night. Physical examination was negative except for varicose veins. The blood pressure was 120/90 and the pulse rate was 110 per minute. A diagnosis of "cardiac neurosis" was made.

She was next seen in June, 1935. At this time her eyes were refracted and the optic fundi were found to be normal. In November, 1936, the patient stated that she had continued to have the episodes described above. The pulse rate was 132 per minute and the blood pressure was 140/90. In March, 1938, the blood pressure was 145/90. Laboratory examination revealed normal urine and blood counts. The Wassermann was negative. She had had no dyspnea, orthopnea, edema, or chronic cough. Other history was negative. She had had two pregnancies. Her father had died of a stroke. Three sisters were living and well. Her husband was suffering from dementia paralytica.

In November, 1938, the pulse rate was found to be 120 per minute and the blood pressure 150/90. The patient was admitted to the hospital at this time and while there had several attacks of tachycardia during which she would become extremely weak and perspire profusely. The skin would blanch and she would become very apprehensive.

She was not seen again until June, 1939, when she returned to the Eye Clinic. She continued to complain of severe headaches and ophthalmoscopic examination revealed papilledema of the right eye with hemorrhages and star-shaped exudates in the right macular region. While in the clinic, the patient had an attack of palpitation of the heart. The pulse was 160 per minute. A systolic murmur was heard over the precordium. The blood pressure varied between 170/90 and 155/100. The patient became faint and the pulse became irregular. It later became regular at a rate of 80 per minute. No murmurs were audible at the slower pulse rate. At another time the blood pressure was found to be 202/138. A six-foot heart plate showed no enlargement of the cardiac shadow. The patient continued to be very nervous and had occasional attacks of weakness, nausea, headache, and tachycardia. The pulse rate was 128 per minute.

In August, 1939, an ophthalmoscopic examination revealed hypertensive retinitis. There was marked compression of the veins where they were crossed by the arteries and many star-shaped exudates were seen. There was papilledema and numerous areas of local attenuation of the lumen of the retinal arteries. In June, 1939, the blood pressure was 200/110.

She was admitted to the hospital for the last time in April, 1940, in a critical condition. She had experienced nausea and vomiting in the morning and gradually lapsed into a coma. The blood pressure was 260/140. There was auricular fibrillation. The right leg and the right arm were flaccid and tendon reflexes were absent. The Babinski reaction was positive on both sides. Shortly after admission, the heart became regular and the blood pressure dropped to 190/110. A lumbar puncture revealed a pressure of 300 millimeters of water. Examination of the eyegrounds now revealed choked discs of four to six diopters and hypertensive retinitis. A venesection was performed

and 500 c.c. of blood was withdrawn but the blood pressure did not fall remarkably. She expired on the same day.

The clinical diagnoses were: (1) Essential hypertension, and (2) cerebral hemorrhage.

At autopsy the following significant findings were noted: The heart weighed 260 grams. It was not enlarged. The valves were all normal. The coronary arteries were not sclerotic. The lungs were negative. The liver, spleen, and the intestinal tract were normal. The left adrenal gland was negative. The right adrenal gland was greatly enlarged. It measures 11x6x6 cm. A narrow shell of cortex was distributed over its surface. The inner portions of the tumor were composed of brown, partly liquified tumor tissue. The tumor weighed 220 grams. The kidneys were normal. Rather marked atherosclerosis of the aorta and of the cerebral arteries was present. There was a massive hemorrhage in the left cerebral hemisphere which communicated with the left lateral ventricle which was filled by a blood clot.

Anatomical Diagnoses: Pheochromocytoma of the right adrenal, cerebral arteriosclerosis with cerebral hemorrhage.

Discussion

Dr. Harold Freedman: The cortex and the medulla of the adrenal gland have entirely unrelated functions. The medula is derived from the neural crest of the ectoderm and is the portion of the gland which produces adrenalin. Three tumors of the adrenal medulla are well recognized. They are: The benign ganglioneuroma, the malignant neuro-epithelioma, which most commonly occurs in children and young adults, and the pheochromocytoma. This last tumor derives its name because the cells are stained by chromium salts. The epinephrine content of this tumor was determined and was found to be about 800 milligrams. These neoplasms were not clearly recognized until about 1922. Since then a number of cases have been reported, some patients being cured by surgical removal of the tumor. The symptoms this patient had are quite typical, namely, episodes of headache, palpitation of the heart, tachycardia, apprehension, and exhaustion. In some of the reported cases, movement of the trunk to the side of the tumor may bring on an attack. Other patients have found that anything which causes excitement precipitated an episode. If the diagnosis is suspected, the tumor may be localized by finding displacement of the kidney on the affected side or by outlining the mass by injection of air into the perirenal space. Patients suffering from these tumors are notoriously poor surgical risks. Two patients died in the hospital during an attack the day before they were to be operated upon for removal of the tumor. The common causes of death are cerebral hemorrhage, acute or chronic heart failure, or sudden death due to hyperepinephrinism. The tumor is usually one found in adults. Its incidence is equal in the sexes and either adrenal gland may be involved. The advanced atherosclerosis that this patient had is probably related to the elevation in blood pressure rather than to the excessive secretion of epinephrine. In rabbits, at least, long continued administration of epinephrine produces changes limited to the aorta, but does not produce atherosclerosis such as was seen in this patient.

Dr. E. T. Bell: Here is a woman who had a benign tumor who could have been cured of her high blood pressure by removal of that tumor. This is a most interesting case. I doubt if there is one like it in the literature with this long story and producing, towards the end, a persistent elevation in blood pressure.

Dr. George E. Fahr: These tumors may occasionally produce constant hypertension. In retrospect, two things in the patient's history indicate the correct diagnosis. In the first place, the patient had an almost constant sinus tachycardia. In the second place, the attacks of palpitation were accompanied by extreme exhaustion.

Dr. E. T. Bell: This is the most remarkable sort of tumor, a tumor that functions. Nearly always a functioning tumor is benign. Other examples of tumors which carry on a function are parathyroid adenomas, granulosa-cell tumors of the ovary, and adenomas of the thyroid and hypophysis. This tumor continues to secrete adrenalin in just about the amount that the patient can handle at first, except during the episodes of hypertension and palpitation of the heart with tachycardia. This tumor has nothing to do with the cortex of the adrenal. Cortical tumors sometimes cause a little hypertension, but never anything like this. They also produce sex changes in women and young males. The elevation in blood pressure accentuated the process of atherosclerosis and thus predisposed the patient to the fatal cerebral hemorrhage.

BONE FORMATION IN OLD SCAR

A. L. PERTL, M.D.
Canby, Minnesota

THE patient, P. J. R., male, aged forty-one, was operated upon for a perforated gastric ulcer Aug. 11, 1938. He had an uneventful recovery and the wound healed by primary intention.

On Aug. 26, 1939, he had a cholecystectomy done, for a chronic infected gall bladder and many stones. The wound healed by primary intention.

On April 27, 1940, he was again admitted to the hospital for lobar pneumonia, was treated with only sulfapyridine and was discharged May 9th.

On October 1940, he felt a hardness in the upper one-third of the wound made in August 1938. On November 11, while shoveling snow, he felt a sharp pain and he could feel a foreign body under the skin about 1.5 inches long. Thereafter all bending and shoveling would produce sharp pains.

On March 22, 1941, the foreign body was removed under local anesthesia. It proved to be a piece of bone 4.2 cm. long, 5 mm. wide, 2 mm. thick on one edge and tapered down to a sharp edge. The upper point was very sharp. The skin and subcutaneous tissue was very, very hard in the upper half of the old scar or for a distance of about 3 inches. The bone was imbedded in the muscle fascia.

A report from Dr. E. T. Bell, of the Pathology Department of the University of Minnesota, stated that the foreign body was bone, and he recalled only one other similar instance. The wound is healing slowly, the firmness in the skin is gradualy disappearing, and the patient is free from all pains.

HISTORY OF MEDICINE IN BROWN COUNTY

Compiled by George B. Weiser, M D.

(Continued from April issue.)

Later Physicians in New Ulm

Dr. Ora C. Strickler, a native of the town of Markham, Ontario, Canada, was born January 7, 1863. His parents, who were Pennsylvania Mennonites, moved to Ann Arbor and later to Lansing, Michigan. Dr. Strickler graduated from the High School at Markham, Ontario, entering the Medical Department of the University of Michigan and graduated therefrom June 25, 1885.

Immediately after his graduation he located at New Ulm, Minnesota, where he continued practising until his death. He took a postgraduate course in Berlin, Germany, in 1888 and 1889.

During his practice at New Ulm he became one of the best known physicians and surgeons in this part of the state. He was a member of the county and state medical societies in which he took a warm and active interest. He took great interest in the civic affairs of his community and served as a member of the Board of Education.

He was local surgeon of the Chicago & Northwestern Railway and of the Minneapolis & St. Louis Railroad up to the time of his death. In 1898 he was president of the State Board of Medical Examiners; from 1900 to 1906, a member of the Board of Regents of the University of Minnesota. He was a Republican in politics and gave much attention to local political affairs. He was a York Rite and Scottish Rite Mason; a member of Zuhrah Temple order of the Mystic Shrine, Minneapolis. In all of these branches he took an active interest.

Dr. Strickler died March 12, 1928.

Dr. Jacob C. Rothenburg graduated from the University of Michigan Medical Department in 1885. He located in New Ulm from January to November, 1887, when he removed to Springfield, Minnesota, where he continued in active practice until the time of his death in 1939.

During his career at Springfield Dr. Rothenburg took an active interest in promoting the prosperity of his community. He had a lucrative practice in Springfield and adjacent territory. He took an active interest in the Masonic bodies, was a Past Master of his local lodge; Past High Priest of Springfield Chapter, a Knight Templar and Scottish Rite Mason. He served as coroner of Brown County and was one of the organizers of the State Bank of Springfield, of which he was vice president and director.

He was given a reception by the citizens of Springfield commemorating his fifty years of practice in that community.

Dr. Louis Albert Fritsche was born May 28, 1862, on his father's farm in Lafayette township, Nicollet County, Minnesota, within two miles of New Ulm. He received his education at Saint Peter High School and taught district school

for one year. He entered the Medical Department of the University of Michigan September 24, 1884, graduating therefrom in medicine June 30, 1887. On July 1, 1887, the new medical law went into effect requiring those applying for license to practice to pass the State Board of Medical Examiners. There were three candidates to pass the Board and Dr. Fritsche was awarded and registered as Number 1.

On August 14, 1887, he opened an office in New Ulm and practised there until the latter part of April, 1889. He then went to Germany to take up postgraduate work and specialized in surgery in Berlin. During his third semester, from April to August, he was second assistant to that famous surgeon, Prof. Julius Woelf.

He was a member of the 10th International Congress which convened in Berlin August 6 to 13, 1890. Dr. Fritsche returned home October 15, 1890, and reopened his office at New Ulm, continuing the practice of medicine until his death in 1931. He was a past president of the Southern Minnesota Medical Association, and was health officer of New Ulm from 1890 to 1894. He served as a member of the Pension Examining Board, and as coroner of Brown County for four terms, from 1896 to 1904. In 1900 he was appointed a member of the State Board of Medical Examiners for three years and last year was president of the Board.

Dr. Fritsche was elected mayor in 1912 and was twice reëlected. In the year 1900 he was elected president of the Brown County Bank, was vice president of the New Ulm Roller Mill Company and directors in several industrial enterprises. In July, 1914, he joined a Commission of Mayors to attend the International Congress of Municipal Executives held in London. In politics he was a Democrat and as delegate attended many state conventions. Later in life he assisted in organizing the Farmer Labor Party and became an aggressive leader until his death in 1931.

Dr. Fritsche, who established the Fritsche Clinic, had four sons graduated in medicine who became members of the clinic. This is a record that has no counterpart in the State of Minnesota.

Dr. Jacob L. Schoch, a native of Selingrove, Pennsylvania, was born in the year 1862. After receiving his education at the Gettysburg College, Pennsylvania, he taught in a rural school for one year, then entered the Medical Department of the University of Michigan, graduating in the year 1885.

He practiced medicine at Walton, Kansas, one year, then established an office in Chicago. He came to New Ulm in 1888 where he continued his practice until his death, which occurred September 22, 1934. He succeeded Dr. A. W. Mueller and also took charge of Dr. Strickler's practice during his absence in Europe. He was a member of the Brown County and Minnesota Valley Medical Societies and the Minnesota State Medical Association.

Dr. Schoch served as a member of the Pension Examining Board, meeting at Mankato, and later was appointed by Governor Merriam as a member of the State Board of Medical Examiners. Throughout his medical career he had a lucrative practice.

Dr. Schoch engaged in many civic enterprises, was one of the organizers and a large stockholder in the present Brown County Agricultural Society. He promoted the first telephone system in the city of New Ulm. He established the New Ulm Investment Company, of which he was the largest stockholder, and was the president of the company until his death. Many residences have been erected by this company. He was a large stockholder and president of the New

Ulm Roller Mill Company and formerly organized and had interests in the Western Lumber Company in Idaho.

Dr. Schoch was not only a successful practitioner of medicine but was recognized as one of New Ulm's prominent business men.

Dr. C. J. B. Hirsch graduated from Rush Medical College in 1868 and located at Black River Falls, Wisconsin. He came to New Ulm in 1891 and moved to Audubon in 1899, where he died October 16, 1901. While located at New Ulm Dr. Hirsch had a large practice, particularly among the Scandinavians.

Dr. George B. Weiser was born September 7, 1857, in Dalmatia, Northumberland County, Pennsylvania, the son of Dr. Charles S. Weiser. He received his early education in the public schools, Freeburg Academy, Benysburg Seminary and Sunbury Academy. He read medicine with his preceptor, Dr. B. L. Kerchner, Dalmatia, Pennsylvania, and entered the Jefferson Medical College, from which he graduated in March, 1879.

On March 28, 1879, Dr. Weiser opened an office at McKees Half Falls, Snyder County, Pennsylvania. In March, 1893, he came to New Ulm, Minnesota, having passed the State Medical Board examination in the fall of 1892 and has been in continuous practice at New Ulm to the present time (1940). He has been engaged in the practice of his profession over sixty-one years.

When the Minnesota Legislature passed a law to establish a State Sanatorium for tuberculosis, an advisory commission was appointed by Governor Van Zandt to select a site for the sanatorium and erect buildings to the extent of money appropriated by the Legislature. The Advisory Commission consisted of Dr. H. L. Taylor, Saint Paul, Dr. J. L. Camp, Brainerd, Dr. G. C. Watham, Warren, and Dr. George B. Weiser, New Ulm.

In the year 1917 Dr. Weiser was appointed a member of the State Board of Medical Examiners, serving for sixteen years, until 1933. He was at one time president of the Board. He is a past president of the Brown County Medical Society and the Redwood-Brown Medical Society; member of Southern Minnesota Medical Association, Minnesota State Medical Association, and fellow of the American Medical Association.

Dr. Weiser was a member of the Electoral College during the Harding campaign, also for the Taft campaign. In the Masonic York Rite bodies he is a Past Master, Charity Lodge; in the Scottish Rite bodies, a 32nd Degree Mason, Winona Consistory. He is a life member of Zuhrah Temple Mystic Shrine, Minneapolis; honorary member Masonic Veteran Association. He was a member of the Board of Education for twenty-two years, for twenty of which he served as president. He is a former vice president of the Brown County State Bank and a charter member and director of the State Bond and Mortgage Company.

Dr. William P. Pfisterer, a native of New Ulm, graduated from the University of Pennsylvania Medical School in 1890. He practiced in New Ulm from July, 1890, to July, 1891, when he moved to Winthrop, Minnesota, where he continued to practice until his death in the later nineties. He was a member of the Minnesota Valley Medical Society.

Dr. Gustav Fischer, born in New Ulm, was principal of the New Ulm High School previous to taking up medicine. He graduated from the Jefferson Medical College, Philadelphia, in 1896, and located at New Ulm the same year. He remained there until October, 1898, when he moved to Minneapolis, continuing his

practice there until his death in 1931. Dr. M. M. Fischer, city physician of Duluth, is his son.

Dr. George F. Reineke was born in Blooming Grove township, Waseca County, May 13, 1871, attended school at Saint Paul College, and graduated from the University of Minnesota Homeopathic Medical School in 1896. Immediately thereafter he located at New Ulm for the practice of his profession. In 1903 he went to Europe (Vienna) to take a postgraduate course in eye, ear, nose and throat work. Returning to New Ulm, he established himself in that specialty, and has continued practicing to the present time (1940).

Dr. Reineke has been a member of the Academy of Ophthalmology and Otolaryngology since 1926. He has been coroner for Brown County since 1910, was at one time health officer of New Ulm and a member of the school board from 1904 to 1919. His son, Harold G. Reineke, is a prominent roentgenologist in Cincinnati, Ohio.

Dr. Reineke was a delegate to the General Conference when the three Methodist churches united—Methodist Episcopal, Methodist Episcopal South and Methodist Protestant Church.

Dr. A. Franklin Strickler graduated from the University of Michigan Medical Department in 1898 and took a postgraduate course in Germany. On his return from Europe he associated himself with his brother, Dr. O. C. Strickler, in New Ulm. After several years in New Ulm he moved to Sleepy Eye, where he continued to practice until his death.

Dr. Mary Strickler, wife of Dr. A. Franklin Strickler, was associated with him in the practice of medicine at Sleepy Eye.

Dr. George F. Beachler graduated from the Medical School at Wooster, Ohio, in the year 1895. He located at New Ulm several years later for a brief period of time. No record can be found concerning him after he left New Ulm. He specialized in the treatment of hernia by using local injections.

Dr. Edmund W. Bayley graduated from the Medical Department of the University of Kansas City in 1898. He located in Minneapolis and moved to New Ulm in 1901; after three years' practice in New Ulm he moved to Sleepy Eye. In 1907 he became a Contract Surgeon in the regular army. He is now retired and resides in California.

Dr. Otto G. Wicherski, native of New Ulm, graduated from Rush Medical College in 1904 and located in New Ulm in 1905. In 1906 he moved to Frankfort, South Dakota. In 1907 he moved to San Diego, California, and was appointed city physician, serving until the time of his death.

Dr. Joseph H. Vogel, well-known and popular physician of New Ulm, was born in New Ulm, March 28, 1879. He graduated from Rush Medical College in January, 1903, and immediately commenced the practice of medicine in New Ulm, where he has successfully been engaged ever since. At one time he served as health officer for New Ulm, and has been a member of the city council, as well as the school board.

He is president of the Farmers and Merchants State Bank of New Ulm, director of the State Bond and Mortgage Company of New Ulm, and is also engaged in a number of financial enterprises.

Dr. Frank W. Pfisterer, a native of Brown County, graduated from Marquette University Medical School, Wisconsin, in the year 1913. He located at New Ulm in 1915, but the latter part of that year moved to Milwaukee, thence to Markeson, Wisconsin. At the present time he is practicing medicine in Milwaukee.

Dr. Gottfried Schmidt located at New Ulm and later moved to Sleepy Eye. His biography appears under the heading, "Sleepy Eye Physicians."

Dr. Otto John Seifert, well-known physician and surgeon, was born in Sigel township, Brown County, February 5, 1888. He spent several years at Saint Thomas Military Academy, then entered the University of Minnesota, from which he graduated in 1910 with the degree of Bachelor of Sciences. He then entered the Medical Department of the University of Minnesota, graduating in the year 1912. He served as intern at the City Hospital, Minneapolis.

In 1912 he located at New Ulm where he has continued the practice of medicine and surgery to the present date (1940). During the World War he served overseas with the rank of Major in the Medical Corps, U. S. Army, in command of Hospital Unit No. 58.

After the war he resumed his practice at New Ulm, where he was health officer for seventeen years. He is a member of the Redwood-Brown County Medical Society, the Minnesota State Medical Association, and the American Medical Association.

He is a member of the Minnesota Radiological Society and American Radiological Society. He took postgraduate courses in Berlin, Vienna, and New York. He is a member of various civic and fraternal organizations and is State Master of the Knights of Columbus.

Dr. Carl W. Scherer, native of New Ulm, graduated from the University of Michigan Medical College in 1907 and was licensed to practice in Minnesota in June, 1907. He was located at New Ulm from 1907 to 1908, practiced in Ruthton, Minnesota, February, 1908, to January, 1909, and entered the Army Medical School, Washington, D. C., in 1909. He served the Madera-Mumore Railroad, Brazil and Bolivia, South America, from 1910 to 1912, inclusive. He then took a postgraduate course in Munich, in 1912 and 1913. Upon his return to the United States he became instructor in Pediatrics at the University of Minnesota, 1914-1915, then moved to Fargo, North Dakota, where he specialized in pediatrics, 1916-1917. From 1917 to 1933 he practiced pediatrics in Duluth and has been health officer, from 1933 to the present time (1940), for St. Louis County, Minnesota.

(To be continued in June issue.)

President's Letter

OUR CENTURY OF PROGRESS

ONE hundred years ago this year, the first civilian, learned in medicine, came to settle in this territory. What visions of the future could he have had as he and his associates made their way into the virgin wilderness finding broad rivers and lakes unknown to the paddles of white men, forests of unbounded beauty and unlimited prairies stretching to the Red River Valley of the North! All these were known only to the aboriginal Indians for ages before the coming of the first white man.

What a surprise he would have if he could return today to find two and one-half million people, descendants of all the nations of the world, among these same surroundings with every luxury of modern civilization at their beck and call. Railroads and broad highways carrying traffic to every city and hamlet, progressive cities and villages dotting the landscape. Well-cared-for farms producing the grains for the mills, and herds of stock, the essentials for the packing plants. The iron mines of the North sending their wealth to the Twin Ports to be carried on the shipping lanes to the east, and the forests and quarries producing the materials for untold numbers of necessary industries.

Surely a century of progress has passed since the coming of Dr. Christopher Carli in 1841.

And then we turn the pages of state history to 1853 and find a small group of medical men gathered in the first meeting of our association to discuss the future of medicine; earnest and interested in their work the same as we are today. Did they vision the progress that eighty-eight years would bring? They certainly knew that if progress was made it meant close association and a tolerant attitude one toward the other, that a strong spirit of coöperation was necessary to the success of the embryo association. They must have felt this or they would not have met together.

What a surprise would await them could they see the progress of medical science as set forth in our annual meeting this month, when again several thousand medical men will meet for essentially the same purpose that they did.

Truly, the members of the Minnesota State Medical Association have much to be thankful for: a fine organization with a true sense of civic responsibility, progressive to the very nth degree. We are essentially interested in our obligation to the people of the State economically and professionally.

Let us, as we again gather together, dedicate ourselves to close coöperation one to another and to a further sense of obligation for the conduct of our association.

Let us work together for the good of the people, of our state and nation; the founders of our association left us a heritage which we must continue to hold sacred.

B. J. Branton, *President*
Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

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BUSINESS MANAGER
J. R. BRUCE

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THE CRIMINAL A.M.A.

SO the A.M.A. and the Medical Society of the District of Columbia are convicted of being criminally guilty of violation of the Sherman Act! The officers of these organizations were quite inconsistently acquited, as well as the other individual doctors indicted. We understand the case is to be appealed to a higher court.

To anyone who had the patience to plow through the reams of testimony which appeared in the *A.M.A. Journal,* much of the evidence might well have been considered irrelevant, incompetent and immaterial. The charge to the jury given by Associate Justice Proctor offered, however, much food for thought. There were some fine distinctions involved and much could be said, and was said, on both sides.

The purpose of the indictment was, without doubt, to undermine the resistance of organized medicine to new and unapproved forms of group practice. Hundreds of new methods are already being tried out by physicians throughout the country to make medical service more available to the public at large. Certainly, the majority of the medical profession, and this means the organized profession, is in a better position to judge the comparative values of new methods of medical practice than any other element in society. The members of the organized profession, it seems, can legally express their disapproval of an organization like the Group Health Association, but cannot legally take any steps that might interfere with the association's activities.

It is perhaps consoling that we, as individual members of the A.M.A., are not adjudged criminals and that the hospitals that barred their doors to non-members of the A.M.A. were not criminals.

Now that doctors, from the standpoint of the Sherman Act, are engaged in trade, perhaps we should follow the suggestion made in one newspaper editorial and behave like a union, have a pay schedule, demand full pay for what we now render to charity (for what union contributes in any comparable way to public charity), a thirty-five hour week and time and a half for over time.

After all, we are members of a profession and not a trade; the distinguishing feature of a profession being that financial compensation is not the main consideration.

It does not seem right that elements in our society should be resorting to expensive legal battles at a time when every effort should be expended to prepare for probable serious exigencies. The expense of this litigation has necessitated certain curtailment in A.M.A. activities. Nevertheless, it is incumbent on the organized profession to fight for its rights and to resist the tendency in governmental circles to overregulate medical practice.

LEGAL ASPECTS OF BLOOD GROUP HEREDITY

IN THIS issue we are publishing the report of the committee of the Minnesota County Attorneys' Association on the use of blood tests to exclude paternity. It is a subject that the rank and file of the medical profession know little or nothing about. We are, therefore, pleased to have the opportunity to present this report.

The authors admirably present the scientific facts regarding blood groups and then even more admirably present their recommendations that Minnesota wait awhile before following the lead of New York, Wisconsin and other states in passing a law relating to the use of blood grouping in proving non-paternity.

While the hereditary transmission of blood characteristics follow well established laws, there are factors which limit the use of blood tests in legal cases involving paternity. At best the test is of value only in a negative way. It has a chance of proving, in sixteen cases out of one hundred, that the wrongly accused is not the father. It is true that if one were wrongly accused, such a chance of proving oneself innocent would doubtless be worth taking. On the other hand there are certain limitations to the use of the test which account for the committee's recommendations that the passage of such a law be deferred. To be of any legal value the honesty and competence of the laboratory expert must be beyond question. Then there is the reluctance of doctors to become involved in litigation, the cost of such a specialized procedure, and the feeling on the part of the committee at least that the passage of such a law is not likely to stimulate the development in Minnesota of specialists competent to do these tests. Perhaps the most important reason for the committee's recommendation is the difference of opinion among medical authorities as to the age when the child manifests his blood group. This, too, often tends to the postponement of a trial for a year or two until certainty can be felt as to the permanency of the child's blood group.

We cannot but agree that the passage of legislation in Minnesota in line with that in our sister state would likely to be useless legislation, of which we already have a plenty. It seems strange to one not a lawyer that legislative enactment should be necessary before one could take advantage of proven facts in relation to hereditary transmissions should the occasion arise. Perhaps it were simpler to be like Cæsar's wife.

MAN OF VISION

BEFORE 1908, by which time he was forty-two years of age, Abraham Flexner had never set foot within a medical school. His whole life had been spent in the field of general education, as a student and a teacher. Early in that year his first book, *The American College,* was published. It was, to use his own words, a severe criticism of the elective system, the lecture system, and assistantships, as he had observed them at Harvard in the year 1905-1906. It was so full of revolutionary ideas that it fell flat, because no one was prepared to act on the sweeping crticism he had made. But it was read by Dr. Henry S. Pritchett, who had become president of the recently established Carnegie Foundation for the Advancement of Teaching and made enough of an impression on him that he asked Flexner to undertake the work of making a survey of medical schools, of which there were then 155 in the United States and Canada. Flexner accepted after some hesitation, for he felt that his lack of any medical education whatsoever would be a handicap, but Dr. Pritchett said that was exactly what he had in mind; that the schools should be studied from the standpoint of the educator rather than from the point of view of the practitioner.

Flexner spent a little over a year and a half in this work and in preparing "Bulletin Number Four," which contains his findings in full detail. It is a merciless exposure of the conditions he found and shook the very foundations of the entire structure of the medical education of a generation ago. The results were cataclysmic. Many schools closed their doors, others merged and all which survived were compelled to inaugurate a program of reorganization directed toward greatly improved standards. Flexner not merely pointed out the weaknesses but set up a framework of constructive suggestion which was widely followed in the succeeding years.

Interest in this epochal work is stimulated by reading the recently published life story* of its creator which gives the intimate details of

*I Remember. The Autobiography of Abraham Flexner, New York, Simon and Schuster, 1940.

the author's efforts in this as well as in other important connections. Well written and easily read, as one would expect from the hand of a scholar, it tells in modest fashion the history of a man whose whole aim in life was directed toward improving existing conditions by rational and practical methods. That he was able to be successful in these various undertakings seems to be due largely to the fact that he was a man of keen perception, fundamentally sound and fearless in his convictions. But whatever the reason, medicine owes him a tremendous debt for his courage and far-sightedness in bringing about the changes which led to its present high educational estate.

GILBERT COTTAM.

SAMPLES FOR BUNDLES FOR BRITAIN

THE reported move in certain quarters to give aid to "Bundles for Britain" by collecting physicians' samples of pharmaceuticals and sending them to England is well meaning. On further consideration it should be evident that packaging this heterogeneous material and shipping it abroad would largely be "love's labor lost." It is not suprising that the pharmaceutical houses have protested this move, for the samples are sent to physicians for a specific purpose. Also, most of the producers have been generous in making donations of vitamin capsules and other needed pharmaceutical products which are of assistance in a more practical way.

The wishes of the pharmaceutical houses are certainly entitled to consideration.

DOCTORS FOR BRITAIN

IT is not surprising that the demand for physicians in Great Britain has exceeded the supply. What with the needs of the army and the war casualties extended to the civilian population the medical profession finds itself overworked. The British Red Cross has, therefore, recently requested the American Red Cross for upwards of 1000 young members of our profession to serve either with the Royal Army Medical Corps or with the Emergency Medical Service, a civilian organization under the Ministry of Health. Applicants must be citizens of the United States, not over forty years of age for service in the Royal Army Medical Corps, nor over forty-five years of age for appointment to the Emergency Medical Service. Physical and professional qualifications will have to be met.

Doctors accepted for the British Army will be commissioned as lieutenants the first year with pay of $1456.50 and a bonus of $400 at the end of the year. The second year they will be promoted to captaincy with pay of $1800 and a bonus of some $600 at the end of the year. Contracts are to be made for one year. Doctors accepted will be provided with transportation and the same disability compensation as is provided the British officers. Volunteers are liable for service wherever British troops are located.

Further information concerning "Doctors for Britain" can be obtained from the Red Cross Headquarters in Washington, D. C.

One Hundred Years of Medical Practice in Minnesota

Attention is being called in the Program of the State Medical Meeting to be held this month, to the fact that just one hundred years ago this month, May 24, 1841 to be exact, the first civilian physician came to Minnesota to practice.

This physician was Dr. Christopher Carli, who was born in Franklin-on-the-Main and was educated at Heidelberg University. He was thirty years old when he arrived at what is now Stillwater and his territory ranged from Lake Pepin in the south to Lake Superior in the north, and from Menominee, Wisconsin, westward. His calls were made on foot, on skates or snowshoes, by canoe and horseback.

How the methods of communication and transportation have changed in the past 100 years! Even more has medical science progressed in this comparatively brief period of time.

Child Health in England

According to the Statistical Bulletin of the Metropolitan Life Insurance Company, the infant mortality in England for the first quarter last year was seventy-seven per annum per 1000 live births, compared with sixty-five per 1000 the same quarter in 1939. This was accounted for by the influenza epidemic which struck England in the early part of last year.

Although the trend in contagious diseases of childhood tended to rise in the latter part of 1940, the only serious increase was in cerebrospinal meningitis.

London today has only one-sixth of its previous child population. In spite of this, air raids brought death to 2,487 children in England in 1940. This number was 11 per cent of the total civilians killed.

Hitler should be proud and pleased.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

CALL FOR ACTION

To the Medical Profession of Minnesota:

As a result of the verdict given at the recent trial of the Federal Government against the American Medical Association the medical profession is "on the spot" as far as public opinion is concerned. This verdict states that the American Medical Association is guilty of a criminal conspiracy to restrain trade as charged by the Department of Justice. In all probability the officers of the American Medical Association will appeal the verdict and, if necessary, move for a retrial in the higher courts.

In the meantime public opinion may well be prejudiced against organized medicine by the results of the trial. Already steps are being taken by those who oppose our code of medical ethics and the principles of organized medicine to take advantage of the situation. Unless the public can be adequately informed as to underlying factors, organized medicine, and with it the present standards of medical practice, may be placed in a precarious position.

The American Medical Association is unable to carry on the campaign because of the following reasons: (1) by virtue of its charter it has been accorded the status of a non-profit, scientific and educational body; (2) it is exempted from income and social security taxation; (3) it must continue the many activities essential to the best interests of medicine and the public welfare under the present budget, and (4) because of legal reasons. The only organization available for this purpose is the National Physicians' Committee. The responsibility for a campaign to arouse public opinion in defense of organized medicine and the principles it stands for will have to be carried on largely by this organization. The N.P.C. has already accomplished a great deal in the defense of American Medicine, but its activities must be accelerated in order to assume the greater responsibilities which have now been thrust upon it.

It is obvious that funds will be necessary to carry on the campaign. It will be necessary to raise more than $100,000 among the physicians of America. Unless this can be done, its efforts cannot be effective. The trustees of the National Physicians' Committee look forward with confidence to the individual members of the American medical profession in supporting this objective. They believe that the members realize their responsibility in the present situation and will give as generously as they can toward furthering the campaign to influence public opinion. For this purpose there is no objection to enlisting the county medical society in our efforts to raise the necessary funds. A definite campaign to do this should be started at once. Each member of the medical profession in Minnesota will receive a circular from the national office of the N.P.C. which will explain the situation in greater detail. We would like to raise at least $10,000 in Minnesota. It is necessary to take immediate action—will you do your part?

W.F.B.

A MINNESOTA PLAN FOR THE CARE OF THE MEDICALLY INDIGENT

Much interest was expressed by medical association representatives all over the country in the papers presented at the Conference on Medical Service in Chicago by Mr. Walter W. Finke, Director of Social Welfare of Minnesota and Dr. A. W. Adson, chairman of the Medical Advisory Committee to the Division.

The general agreement was that Minnesota had stepped out ahead in the solution of the knotty problems of medical relief in rural areas. The paper presented by Mr. Finke is given here in full because it constitutes an official expression of policy which is of vital interest to all physicians. Dr. Adson's paper, slightly abridged to avoid duplication, is printed also as interesting evidence of the complete coöperation of his committee and the physicians of the state in the plan.

Mr. Finke: I acknowledge with appreciation the privilege of appearing on your program today. It is but natural that I approach with diffidence the presentation to a professional group of a topic which is fundamentally the concern of that group itself. I am encouraged to do so, however, by the fact that I am to share in this presentation with a distinguished member of your own profession, Dr. A. W. Adson, who, during the past year and a half, has served ably as chairman of the Medical Advisory Committee to the Division of Social Welfare of the State of Minnesota.

It is our mutual intention today to explain and discuss the very rapid developments of the past year and a half with regard to the medical care of those many people in our State who are, in one way or another, dependent for assistance on one of the many welfare programs now maintained by government. It shall be my province to discuss the general administrative aspects of the problem and to set forth and define the basic and fundamental principles which underlie our plan of operation. These points it seems quite logical for me to discuss since I represent the viewpoint of the administrator and, so far as the State of Minnesota is concerned, of government. Doctor Adson, who will shortly succeed me on this platform, will discuss the practical application and working of the program from the standpoint of the practitioner and the medical profession.

Now then, to a discussion of the matter at hand—

Welfare Patch Work

You are all of you familiar, I believe, with the patch-work growth of governmental welfare programs during the twirling thirties. Speeded by the necessity of meeting problems hitherto uncomprehended by government, there came into being a number and variety of welfare programs, each calculated to meet a part or segment of the total of human needs; some of these were spasmodic, some were strong enough to survive—with certain modifications, most were unrelated to the others at the time of their own conception. It was entirely natural, therefore, that we should soon reach a time when the urgent need was not for more specific welfare programs, but rather for a bringing together and adjusting of these semi-independent efforts within the confines of a sound and integrated pattern of social welfare. Recognizing this need, Minnesota—less than two years ago—created a unified division of welfare in the State government and placed authority for the supervision of all welfare programs in that one governmental department. Thus the first fundamental of progress in the administration of welfare programs in Minnesota has become that of *integration.*

Medical Implications

When this newly-created Division of Social Welfare started to function in July, 1939, there was created in its initial internal organizational structure a Medical Unit, headed by Dr. H. E. Hilleboe, a full-time medical man of highest professional standing, whose background includes not only extensive experience as a private practitioner but training in the field of public health as well. Hence it was recognized—and this is the second basic fundamental which underlies Minnesota's welfare program—that everyone of the individual welfare programs has a medical implication; that involved in each of those programs are numerous medical problems best solved by medical men; that in the conduct of every one of these medical programs there is involved, in some way or other, medical care for an indigent person; that, in essence, it is the composite of all of these elements which constitutes a program of medical care in the field of welfare.

Hence it is the function of the Medical Unit of the Division of Social Welfare to act in a threefold capacity. First, it conducts those direct medical programs for which the State assumes

responsibility, such as the program for crippled children, supervision of tuberculosis sanatoria, licensing of maternity homes and the like. Second—and fundamentally important—the Medical Unit has the responsibility of developing and directing a soundly conceived program of medical research—for certainly if we are to progress in this whole field of medical and institutional care, our emphasis must constantly be on research. Third, this Unit serves all state welfare programs insofar as problems of medical care are concerned and develops the modus operandi by which our relationship with the medical profession itself is established and maintained.

Basis Individual

Thus it is that in Minnesota, our program of medical care for the indigent is made up of a number of elements—the medical care given an old age assistance recipient which is included in his monthly grant; the medical care given to a dependent child, included in the aid to dependent children's grant of its mother; medical care given to a general relief recipient, or provided by supplementary relief grant to a WPA worker—all of these are elements of the total whole which we describe as our medical care program. Yet notice the important fact, namely, that in each instance, the medical care is given to the recipient on the basis of his being an individual and with relation to the implications of his individual and family problems.

I believe that the problem of medical care should be considered as an integral part of the total care to be given to an individual. I do not believe that the one item "medical care" should be isolated and set up as a thing apart—as something to be approached and handled on a regimented basis. I feel exactly the same way about all care which should be given to people in need. They must have food—yet I would not force them to go to a commissary for specified items. They must have shelter—yet I would not force them to live in a camp. They must have clothing—yet, within reasonable limits, they should have the right of selection of such articles. In the same way, all of these people should have adequate medical care—yet there should be free choice of physician on an individual basis and not the compulsion of reliance upon a specified practitioner.

Authority Decentralized

The third principle which underlies our plan of operation of welfare programs in Minnesota is that of the decentralization of administrative authority. It is necessary that this principle be briefly explained since Doctor Adson will shortly refer to the creation of county medical advisory committees. The purpose and nature of their existence is explained by our plan of decentralization of administrative authority.

I think it is now well agreed among those of us who are engaged in the administration of welfare programs, that the cost of these programs is too great in total to be borne by any one of the three levels of government—local, state or federal. Assuming, then, that there is a sharing of the costs of these programs, it is my belief that the soundest administration of the programs can be obtained by a decentralization of authority. That is, subject to the maintenance of minimum standards of operation and to the achievement of substantial uniformity throughout a State, the actual processes of administration should be placed close to the people who are to receive assistance from these programs. This makes possible individual attention; it brings into play local discretion and responsibility; and it avoids the sometimes unfortunate results of centralization of authority with its attendant inelasticity and mass approach to a problem. To further dwell upon this point is here not possible. However, let me simply say that, following this theory of governmental operation, the actual administrative authority for conduct of the welfare programs in Minnesota is vested in integrated county welfare boards, representative not only of elected officials, but also of lay members of the community. These boards conduct the programs under the general guidance and leadership of the State Division of Social Welfare which establishes minimum standards and sets up the general rules governing the welfare programs.

Advisory Committees Named

But one other fundamental remains to be discussed as a prelude to Doctor Adson's presentation. Having created a Medical Unit in the Division of Social Welfare, we immediately turned to the medical profession itself for assistance in guiding us in the conduct of the medical portion of our welfare programs. This was done upon the basis of our fourth fundamental. That is—

that the solution of medical problems in the welfare field should be found by working through and with the medical profession itself.

Proceeding upon this very sound assumption, I named a State-wide Medical Advisory Committee to work with the Division of Social Welfare. The membership of this committee was chosen from a panel of names submitted to me at my request by the Council of the Minnesota Medical Association. Doctor Adson was named Chairman by the committee itself. Ex officio members of the committee include the executive officer of the State Board of Health, the executive secretary of the State Medical Association, and the Chief of the Medical Unit of the Division of Social Welfare. This committee has met regularly throughout the past year and all medical policies relating to welfare programs are first submitted to the committee for its consideration and approval before adoption by the Division of Social Welfare. With the approval of this Committee, small technical sub-committees were established in the various specialties to work with the Division on problems arising in such fields as Tuberculosis, Ophthalmology, Orthopedics, Pharmacy, and Dentistry. Reports on the work of these technical subcommittees are made periodically to the general advisory committee.

At the suggestion of the State-wide Advisory Committee and the State Medical Association, county medical advisory committees were created in each county of the State to work in coöperation with local county welfare boards in handling—on the local level—medical problems which relate to the welfare programs. Whenever a medical bulletin relating to one of the welfare programs has been prepared by the Division of Social Welfare, and cleared through, amended and approved by the State-wide Medical Advisory Committee, this bulletin is then released by my office to the county welfare boards and at the same moment copies of the bulletin are released by the office of the State Medical Association to the county medical advisory committees.

Profession Assumes Responsibility

Thus the medical profession itself participates in advancing the program of medical care in the welfare field in Minnesota. Through these advisory committees, the profession recognizes its responsibility in providing a high standard of medical care to all of these people. It likewise recognizes that it must assume responsibility of controlling certain practices of its own members which may not be conducive to a continuing amicable relationship as between the welfare boards and the medical profession itself. Also, the profession has recognized the fact that funds are not unlimited and that the problem is to provide adequate medical care within the limits of funds available. Working side by side in this mutually advantageous and coöperative arrangement, the Division of Social Welfare and the medical profession of the State of Minnesota have succeeded in developing ways and means during the past year and a half of advancing our program of medical care. Throughout this period of time, we have proceeded upon the basis of the four fundamentals which I have outlined in this brief presentation. Let me review them briefly for you. They are:

1. The integration of welfare programs within the structure of government so as to eliminate confusion and clarify lines of administrative authority;
2. The recognition of adequate medical care as an essential element of human need, to be provided upon an individual basis with free choice of physician preserved;
3. The decentralization of administrative authority;
4. The solution of medical problems in the welfare field through and with the medical profession itself.

As an administrator, I can say in all sincerity that I am deeply indebted to the medical profession of my State for the rôle it has played in developing our program of medical care. As I look to the future, I have no fear of those problems that as yet remain unsolved in this field—I am confident in the thought that together with the profession we shall find the sound solution.

It is a pleasure now to yield the platform to Dr. A. W. Adson, chairman of the Minnesota Medical Advisory Committee.

Dr. Adson: The plans for rendering medical care to indigent and near-indigent patients differ for those who live within the larger cities and for those who live in the rural districts and smaller towns. The larger municipalities provide city hospitals for those that are indigent and those that are medically indigent. The expenses for such relief are financed from the city's relief

budget. However, this budget is supplemented by state relief funds. The economic status of patients seeking medical relief in the city hospital is determined by the department of social welfare of the respective hospital. Those that are considered eligible for medical treatment receive hospitalization and medical care gratis.

County System Best

The county and rural districts, containing towns and villages, operate on one of two systems: the county plan or the township plan. The county plan appears to work more efficiently than the township plan, since the county units operate through a welfare board and an executive secretary, while the township plan calls for less centralized organization and medical relief is approved by a greater number of authorized individuals, which permits of political interference. The medical relief rendered by the county plan is administered by one of three procedures. The first is the one in which the welfare board allocates a set sum for professional services, in which all of the physicians in the county participate on a unit basis, giving the clients the free choice of physician, hospital and medical bills being approved by the welfare board as they arise. The second procedure is one in which the medical client appeals to the executive secretary of the welfare board, who approves the relief and authorizes the patient to choose his physician, who decides the type of medical relief necessary and the amount of medical and hospital service necessary, bills being paid from the county welfare funds which are derived from county taxation and supplemental state aid from the state relief funds. The third procedure is the one in which the county welfare board hires a physician to render medical aid to those who are entitled to it. This last procedure has not proved satisfactory since patients are not given the privilege of choosing their physicians and too often the physician who accepts the position of county physician, whether well qualified or not, has more patients than he can properly care for.

Freeborn County Plan

The first procedure under the county plan has worked out more satisfactorily than the other two, since fewer conflicts between the patient and the welfare board have arisen. An illustration of the success of this procedure appeared in Freeborn County, in the state of Minnesota. The physicians of that county agreed to render professional services to indigent clients for the year of 1940 for the sum of $7,500 plus $1,000 to be used for drugs. At the conclusion of the year it was learned that the services rendered by the county physicians to these clients, on a fee basis of 60 per cent of their standard fees for general medicine was $500 in excess of the sum allotted. Members of the county welfare board were so pleased with the services rendered by the physicians, and the harmony among all involved, that they made up the difference and paid the county physicians the deficiency of $500. For the ensuing year the Freeborn County welfare committee has allocated $8,000 for professional services for the care of indigent clients. They have likewise agreed to approve hospital bills and medical supplies as they did in 1940, as authorized by the physicians of the county. They have also agreed to provide professional fees on a 60 per cent basis, hospitalization and medical supplies for the occasional indigent client who requires special medical treatment which is not obtainable in Freeborn County, providing that the local physicians approve the reference to a specialist outside of the county.

The fee basis for professional services is not a fixed one for all counties. However, 60 per cent of the average fee charged for the respective communities is the fee that is usually agreed on and dates back to the State Emergency Relief Administration plan, when state and federal reliefs became necessary. The medically indigent, those in the low income groups, and those who are employed under the Works Progress Administration, if they are unable to provide for their own medical care, must apply to the county commissioners for aid, as they are not entitled to medical relief from the local welfare board under the present statutes. The non-resident, or floater, finds himself in an embarrassing position, since he does not qualify for medical relief under the social welfare regulations, nor is the county obliged to assume the responsibility. Services that he receives must necessarily be donated by both physicians and hospitals.

Controversial Medical Problems

Although the State of Minnesota, through its director of social welfare and the welfare groups of the respective counties and its physicians has

developed adequate plans for providing medical care for indigent patients, controversial problems have arisen and still continue to arise, the most common of which are as follows:

1. Does the client need medical care?
2. How much medical care is needed?
3. Is hospitalization required?
4. What fee should be charged for professional services and hospitalization?
5. Who shall decide that medical care is considered an emergency?
6. Is the physician obliged to render a service gratis in a case of emergency when the client failed to secure an authorization?
7. How should physicians be controlled if they tend to administer excessive or unnecessary medical care?

Minnesota's department of administration through its director, Walter W. Finke, approached the Council of the Minnesota State Medical Association for advice. The plan developed with Council approval has been outlined by Mr. Finke.

The state medical advisory committee meets at the call of the director. The first order of business is to review the disposition of controversies presented at a former meeting and to offer resolutions when final disposition is needed. The next order of business is to review reports of the technical committees such as those on dental care, the crippled child, the tuberculous and the psychiatric patient. Following this, problems of state interest are discussed. These problems may have to do with choice of a physician who resides in the trade area but not in the county, county surveys concerning service and cost of medical care, the responsibilities of county commissioners with reference to medical needs in the low income group and changes in the state law to provide funds for professional services during the terminal illness of the aged who are receiving old age assistance.

Results

The following illustrations exemplify some of the results accomplished by the Minnesota plan of coöperation between welfare boards and physicians:

1. Complaint was made by a county welfare board which refused to pay for professional and hospital services for a medical relief client who chose as his physician one who resided in another county. It so happened that the relief client lived in another trade area than that of the county seat and his family physician was a resident of the adjoining county, which was but a few miles from the client's home.

It was decided that the patient was entitled to choose his own physician in the trade area, even though he resided in an adjoining county.

2. A county welfare board complained that a young physician entering the community suddenly found it necessary to operate on an excessive number of relief clients and thus objected to paying the professional bill. Following investigation, the state medical advisory committee recommended that the surgeon, complained of, submit his clinical, operative and pathologic records to the county medical advisory group. If they then found that his records were in order and the patients required surgical care, the bill should be paid. The investigation by the local medical committee cleared the surgeon of criticism and the bills were paid.

3. Complaints were made against a physician on the ground that he was submitting bills for obstetrical care when the patients failed to pay for services received. Investigation by the field representative, executive secretary of the state medical association, and Dr. Hilleboe, Chief of the Medical Unit of the State Division of Social Welfare, revealed that several of these patients were not true relief clients but were individuals who came within the low income group and were medically indigent. A compromise resulted in which the county commissioners agreed to pay a limited fee for those who came within the low income group and who were not entitled to relief from the welfare board.

Coöperation Gratifying

The coöperation between the state department of social welfare and the physician since the development of the Minnesota plan has been most gratifying. Although physicians are inclined to be skeptical of relief agencies as institutions attempting to dictate the procedures of medical practice, destroy the freedom of free choice of physician by the patient and at the same time expect physicians to render their service gratis, they have found this not to be true under the present state administration. Governor Stassen, through his director, Walter W. Finke, has invited the medical profession to help solve its own problems.

These public officials have recognized that medical relief of the indigent client is one of the essential reliefs that society must provide. They expect the medical profession to contribute in part to this relief but they also are willing to compensate the physician for the services rendered to the relief client in so far as funds have been provided.

FOR YOUR INFORMATION

(Monthly Editorial prepared by the Medical Advisory Committee)

Your Medico-Legal Advisory Committee believes it apropos at this time to place before you some of the legal aspects of the practice of medicine in the State of Minnesota, the knowledge of which may aid in preventing malpractice suits. The following excerpts are quoted from an address by Mr. Stan D. Donnelly, prominent Saint Paul attorney, who is particularly well-qualified in legal matters pertaining to the practice of medicine in Minnesota, and who has had a wide experience in the trial of malpractice suits:

"With respect to the legal aspects of the practice of medicine, the first thing to be borne in mind is that the law imposes a relation between a physician and his patient based upon contract. . . . . .

"Every physician, when he undertakes to diagnose, operate, or prescribe for a patient, enters into a distinct contractual relation with that patient. The law imposes upon the Doctor the duty of possessing that reasonable degree of learning and skill that is ordinarily possessed by physicians and surgeons in the locality where he practices, and which is necessary to qualify him to engage in the practice of medicine and surgery.

"He is required by law to use reasonable care and diligence in the exercise of his skill to accomplish the purpose for which he is employed. He is also obliged to use his best and honest judgment. . . . . .

"The law holds a physician liable for an injury to his patient resulting from want of the requisite knowledge and skill, for the failure to exercise reasonable care, or the failure to use his best judgment. However, it is unquestionably the general rule of law that the physician is not a guarantor of cures or good results in the absence of express agreement to that effect; he is not liable for a mere mistake of judgment if he honestly exercised his best judgment after careful examination and consideration of available information and facts in the situation with which he was confronted at the time.

"If the Doctor does not ascertain available facts and information prior to exercising his judgment he may be held liable as for negligence in case of mistake of judgment. . . . . .

"Another obligation imposed by law upon physicians and surgeons is that they keep abreast of the times. This does not mean that the physician or surgeon must be ahead of the times—it does not require him nor give him the right to experiment upon a patient—but it does mean that he must keep up with the times; in other words, know and use the generally approved methods of practice of the average skilled physician and surgeon in the community in which he is engaged in practicing his profession.

"It is a general rule of law to be applied in a malpractice suit against a physician or surgeon that he is not charged with possessing the highest degree of knowledge or exercising the highest degree of skill, the sort that is possessed by only a few in any business or profession, but he is required in a given case to have exercised the skill and learning of the average Doctor in his community."

Your Committee believes that the preceding information as to the legal responsibility of doctors in the practice of medicine will prove of value to the physicians in Minnesota. In future editorials further information along this line will be included.

Remember, that while illness is commonplace to the doctor, it is unusual to the patient.

W.H.H.

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Supreme Court Upholds Eight-Year Sentence of Saint Paul Osteopath

Re: State of Minnesota vs. Samuel M. Stern.

On April 10, 1941, the Supreme Court of Minnesota upheld the sentence of not to exceed eight years ordered by Judge Kenneth G. Brill of the Ramsey County District Court on May 13, 1940, for Samuel M. Stern, Saint Paul osteopath, who pleaded guilty to an information charging him with the crime of abortion. Stern was convicted of the crime of embezzlement on January 3, 1922, by a jury in Orange County, California. He served one year in the San Quentin prison and was then paroled. In September, 1938, he obtained a pardon from former Governor Merriam of California "in order to restore his citizenship." Stern claimed that having been pardoned by the Governor of California, he could not be given a double sentence by Judge Brill in the abortion case. However, the Supreme Court of Minnesota upheld Judge Brill and pointed out that the Legislature had not excepted pardoned prior criminal offenses from the habitual criminal law of this state, and, therefore, Stern was properly sentenced by Judge Brill to a term of not to exceed eight years at hard labor.

Stern was arrested in Saint Paul following the death of a twenty-one year-old Bemidji girl, who had been to his office for a criminal abortion. The investigation into that case disclosed that Stern had previously aborted another Bemidji girl and it was to this latter offense that Stern pleaded guilty. Stern's osteopathic license has since been revoked by the State Board of Osteopathic Examiners.

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MINNESOTA STATE MEDICAL ASSOCIATION

COUNTY SOCIETY ROSTER

BLUE EARTH COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of each month
Annual meeting in May
Number of Members: 36

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Black, William.....Mankato
Butzer, J. A.....Mankato
Dahl, G. A.....Mankato
Denman, A. V.....Mankato
Edwards, R. T.....Elysian
Franchere, F. W.....Lake Crystal
Fugina, G. R.....Mankato
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Hankerson, R. G.....Minnesota Lake
Hassett, R. G.....Mankato
*Holbrook, J. S.....Mankato
Howard, M. I.....Mankato
Huffington, H. L.....Mankato
Jones, O. H.....Madison Lake
Juliar, R. O.....St. Clair
Kaufman, W. B.....Mankato
Kearney, R. W.....Mankato
Kemp, A. F.....Mankato
Koenigsberger, Charles .....Mankato
Liedloff, A. G.....Mankato
Lloyd, H. J.....Mankato
Luck, Hilda .....Mankato
Macbeth, J. L.....St. Clair
Mickelson, J. C.....Mankato
Miller, V. I.....Mankato
Morgan, H. O.....Amboy
Penn, G. E.....Mankato
Schlesselman, J. T.....Mankato
Schmidt, P. A.....Good Thunder
Sohmer, A. E.....Mankato
Stillwell, W. C.....Mankato
Troost, H. B.....Mankato
Vezina, J. C.....Mapleton
Wentworth, A. J.....Mankato
Williams, H. O.....Lake Crystal

BLUE EARTH VALLEY MEDICAL SOCIETY

Faribault and Martin Counties

Regular meetings, first Thursday of January, May, August and November
Annual meeting, first Thursday in November
Number of Members: 37

President
Demo, P. W.....Wells

Secretary
Mills, J. L.....Winnebago

Bailey, H. B.....Fairmont
Barr, W. H.....Wells
Bergen, C. T.....Bricelyn
Blanchard, H. G.....Fairmont
Boysen, Herbert .....Welcome
Chambers, W. C.....Blue Earth
Cooper, M. D.....Winnebago
Demo, P. W.....Wells
Farrish, R. C.....Sherburn
Fisher, I. I.....Ceylon
Gardner, V. H.....Fairmont
Havel, T. E.....Blue Earth
Heimark, J. J.....Fairmont
Henderson, A. J.....Kiester
†Holm, P. F.....Wells
Hunt, R. C.....Fairmont
Hunt, R. S.....Fairmont
Hunte, A. F.....Tempe, Ariz.
Johnson, D. W.....Fairmont
†Johnson, H. P.....Fairmont
Krause, C. W.....Fairmont
Luedtke, G. H.....Fairmont
MacMillan, D. G.....Triumph
McGroarty, J. J.....Easton
Miller, H. A.....Fairmont
Mills, J. L.....Winnebago
Parsons, R. L.....Monterey
Raymond, J. H.....Canby
Rowe, W. H.....Fairmont
Russ, H. H.....Blue Earth
Sommer, A. W.....Elmore
Sybilrud, H. W.....Bricelyn
Thayer, E. A.....Truman
Vaughan, V. M.....Truman
Virnig, M. P.....Wells
Wilson, C. E.....Blue Earth
Zemke, E. E.....Fairmont

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle and Yellow Medicine Counties

Regular Meetings Bi-Monthly
Annual meeting, February
Number of Members: 26

President
Hauge, M. I.....Clarkfield

Secretary
Boody, G. J., Jr.....Dawson

*Bacon, R. S.....Montevideo
Bergh, L. N.....Montevideo
Boody, G. J., Jr.....Dawson
Burns, F. M.....Milan
Burns, M. A.....Milan
Foshager, H. T.....Clara City
Hauge, M. I.....Clarkfield
Herbert W. L.....Granite Falls
Holmberg, L. J.....Canby
Hudec, E. R.....Echo
Johnson, C. M.....Dawson
Johnson, V. M.....Dawson
Jordan, L. S.....Granite Falls
Kath, R. H.....Wood Lake
Kaufman, W. C.....Appleton
Lee, W. N.....Madison
Lima, Ludvig.....Montevideo
Minge, R. K.....Clarkfield
Nelson, M. S.....Granite Falls
Pertl, A. L.....Canby
Roust, H. A.....Montevideo
Sanderson, A. G.....Granite Falls
Schmidt, P. G., Jr.....Granite Falls
Smith, L. G.....Montevideo
Swezey, B. F.....Bellingham
Westby, Magnus.....Madison
Westby, Nels.....Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Regular meetings three times a year
Annual Meeting, December
Number of Members: 26

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Secretary
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†Aborn, W. H.....Hawley
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Duncan, J. W.....Moorhead
Ellingson, A. R.....Detroit Lakes
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Gosslee, G. L.....Moorhead
Gunderson, R. M.....Lake Park
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DAKOTA COUNTY MEDICAL SOCIETY

Number of Members: 3

Acting Secretary
Peck, L. D.....Hastings

Burns, L. S.....So. St. Paul
Peck, L. D.....Hastings
Peck, L. R.....Hastings

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Chisago, Isanti, Kanabec, Mille Lacs, Pine and Sherburne Counties
Regular meetings January, March, May, July, September and November

Annual meeting, November
Number of Members: 36

President
McBroom, D. E. .....Cambridge

Secretary
Nordman, W. F.....Mora

*Deceased
†Affiliate or Associate

Arends, A. L.....Sandstone
Blomberg, W. R.....Princeton
Blumenthal, J. S.....Columbia Heights
Bossert, C. S.....Mora
Brink, D. M.....Isle
Brownstone, Manuel.....Sandstone
Bunker, B. W.....Anoka

Callahan, F. F.....Pokegama
Clothier, E. F.....Elk River
Cooney, H. C.....Princeton
†Dedolph, T. H.....Braham
Dredge, H. P.....Sandstone
Fredlund, M. L.....Milaca
Gardner, W. P.....Anoka
Gaviser, David.....Princeton
Gully, R. J.....Cambridge
Halpin, J. E.....Rush City
Hedenstrom, L. H.....Cambridge
Holmes, A. E.....Rush City
Johnson, A. R.....Isanti
Kelsey, C. G.....Hinckley
McBroom, D. E.....Cambridge
Mork, F. E.....Anoka
Nordman, W. F.....Mora
Nygren, W. T.....Braham
Olson, L. M.....Chisago City
Petersen, P. C.....Braham
Peterson, A. A.....Mora
Roehlke, A. B.....Elk River
Schlesselman, George.....Anoka
Spurzem, R. J.....Anoka
Stephan, E. L.....Hinckley
Swensen, R. G.....North Branch
Tesch, G. H.,.....Elk River
Vik, Melvin.....Onamia
Whitney, R. A.....Cambridge

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly
Annual meeting, December
Number of Members: 22

President
Gullixson, A.....Albert Lea

Secretary
Prins, L. R.....Albert Lea

Barr, L. C.....Albert Lea
Branham, D. S.....Albert Lea
*Burns, H. D.....Albert Lea
Butturff, C. R.....Freeborn
Calhoun, F. W.....Albert Lea
Donovan, D. L.....Albert Lea
Folken, F. G.....Albert Lea
Freeman, J. P.....Albert Lea
Freligh, W. P.....Albert Lea
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gullixson, A.....Albert Lea
Kaasa, L. J.....Albert Lea
Kamp, B. A.....Albert Lea
Leopard, B. A.....Albert Lea
Neel, H. B.....Albert Lea
Palmer, C. F.....Albert Lea
Palmer, W. L.....Albert Lea
Palmerton, E. S.....Albert Lea
Prins, L. R.....Albert Lea
Schultz, J. A.....Albert Lea
Swanson, R. R.....Albert Lea
Whitson, S. A.....Alden

GOODHUE COUNTY MEDICAL SOCIETY

Regular meetings, none
Annual meeting, December
Number of Members: 22

President
Liffrig, W. W.....Goodhue

Secretary
Brusegard, J. F.....Red Wing

Aanes, A. M.....Red Wing
Aanes, A. R.....Ellsworth, Wis.
Anderson, S. H.....Red Wing
Baldigo, E. M.....Red Wing
Brusegard, J. F.....Red Wing
Claydon, D. R.....Red Wing
Claydon, H. F.....Zumbrota
Claydon, L. E.....Red Wing
Flom, M. G.....Zumbrota
Graves, R. B.....Red Wing
Hartnagel, G. F.....Red Wing
Hedin, R. F.....Red Wing
Johnson, A. E.....Red Wing
Johnson, M. R.....Red Wing
Jones, A. W.....Red Wing
Juers, E. H.....Red Wing
Kimmel, G. C.....Red Wing
Liffrig, W. W.....Goodhue
McGuigan, H. T.....Red Wing
Nordholm, V. W.....Ellsworth, Wis.
Sherman, R. V.....Red Wing
Smith, M. W.....Red Wing
Steffens, L. A.....Red Wing
Vaaler, T.....Cannon Falls
Williams, M. R.....Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday each month excepting
June, July, August and September
Annual meeting, October
Number of Members: 642

President
Morse, R. W.....Minneapolis

Secretary
Daniel, L. M.....Minneapolis

Executive Secretary
Mr. J. H. Baker.....Minneapolis

Aagaard, G. N., Jr.....Minneapolis
Abramson, Milton.....Minneapolis
Alexander, H. A.....Minneapolis
Aling, C. A.....Minneapolis
Aling, C. P.....Minneapolis
Allen, H. W.....Minneapolis
Allison, R. G.....Minneapolis
Altnow, H. O.....Minneapolis
Andersen, A. G.....Minneapolis
Andersen, S. C.....Minneapolis
Anderson, D. D.....Minneapolis
Anderson, E. D.....Minneapolis
Anderson, E. R.....Minneapolis
Anderson, F. J.....Minneapolis
Anderson, J. K.....Minneapolis
Anderson, K. W.....Minneapolis
Anderson, P. A.....Minneapolis
Anderson, U. S.....Minneapolis
Andreassen, E. C..Camp Claiborne, La.
Andresen, K. D.....Minneapolis
Andrews, R. S.....Minneapolis
Andrus, F. C.....Minneapolis
Annis, H. B.....Minneapolis
Arey, S. L.....Excelsior
Arlander, C. E.....Minneapolis
Arling, L. S.....Minneapolis
Arnold, Anna W.....Minneapolis
Arnold, D. C.....Minneapolis
Arvidson, C. G.....Minneapolis
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Baken, M. P.....Minneapolis
Baker, A. B.....Minneapolis
Baker, A. T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, Looe.....Minneapolis
Balkin, S. G.....Minneapolis
†Barber, J. P.....Minneapolis
Barr, R. N.....St. Paul
Barron, Moses.....Minneapolis
Bass, G. W.....Minneapolis
Baxter, S. H.....Minneapolis
Bayard, H. F.....Minneapolis
Beard, A. H.....Minneapolis
Beckman, W. G.....Minneapolis
Bedford, E. W.....Minneapolis
†Bell, E. T.....Minneapolis
Belzer, M. S.....Minneapolis
Benesh, L. A.....Minneapolis
Benesh, N. G.....Minneapolis
Benjamin, A. E.....Minneapolis
Benjamin, E. G.....San Antonio, Tex.
Benjamin, H. G.....Ft. Knox, Ky.
Benn, F. G.....Minneapolis
Berger, A. G.....Minneapolis
Bergh, G. S.....Minneapolis
Berkwitz, N. J.....Minneapolis
Berman, Reuben.....Minneapolis
Bessesen, A. N., Jr.....Minneapolis
Bessesen, D. H.....Minneapolis
Bessesen, W. A.....Minneapolis
Blake, James.....Hopkins
Blake, J. A.....Hopkins
Blumstein, Alex.....Minneapolis
Boehme, E. J.....Minneapolis
Boehrer, J. J.....Minneapolis
Boies, L. R.....Minneapolis
Booth, A. E.....Minneapolis
Boreen, C. A.....Minneapolis
Borgeson, E. J.....Minneapolis
Borman, C. N.....Minneapolis
†Bouman, H. A. H.....Minneapolis
Boynton, Ruth E.....Minneapolis
Bratrud, A. F.....Minneapolis
Brekke, H. J.....Minneapolis
Brooks, C. N.....Minneapolis
†Brown, E. D.....Paynesville
Brutsch, G. C.....Minneapolis
Bryant, F. L.....Minneapolis
Buchstein, H. F.....Minneapolis
Bulkley, Kenneth.....Minneapolis
Burlingame, D. A.....Minneapolis
Butler, John.....Minneapolis
Buzzelle, L. K.....Minneapolis
Cable, M. L.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Callerstrom, G. W.....Minneapolis
Cameron, Isabell L.....Minneapolis
Camp, W. E.....Minneapolis
Campbell, L. M.....Minneapolis
Campbell, O. J.....Minneapolis
Cardle, A. E.....Minneapolis
Carey, J. B.....Minneapolis
Carlson, Lawrence.....Minneapolis
Carlson, L. T.....Minneapolis
Caron, R. P.....Minneapolis
Caspers, C. C.....Washington, D. C.
Cavanor, F. T.....Camp Forest, Tenn.
Challman, S. A.....Minneapolis
Chesley, A. J.....Minneapolis
Christenson, G. R.....Minneapolis
Christianson, H. W.....Minneapolis
Clark, H. S.....Minneapolis
Clay, L. B.....Minneapolis
Cochrane, R. F.....Minneapolis
Cohen, B. A.....Minneapolis
Cohen, S. S.....Oak Terrace
Colp, E. A.....Robbinsdale
Condit, W. H.....Minneapolis
*Cook, H. W.....Minneapolis
Cooperman, H. O.....Minneapolis
Corbett, J. F.....Minneapolis
Corniea, A. D.....Minneapolis
Cranmer, R. R.....Minneapolis
Cranston, R. W.....Minneapolis
Creevy, C. D.....Minneapolis
Curtin, J. F.....Minneapolis
Cutts, George.....Minneapolis
Dady, E. E.....Minneapolis
Dahl, E. O.....Minneapolis
Dahl, J. A.....Minneapolis
Daniel, D. H.....Minneapolis
Daniel, L. M.....Minneapolis
Davis, J. C.....Minneapolis
del Plaine, C. W.....Minneapolis
Devereaux, T. J.....Wayzata
Diehl, H. S.....Minneapolis
Diessner, H. D.....Minneapolis
Dippel, A. L.....Minneapolis
Doering, R. E.....Minneapolis
Dorge, R. I.....Minneapolis
Dornblaser, H. B.....Minneapolis
Dorsey, G. C.....Minneapolis
Dowidat, R. W.....Minneapolis
Doxey, G. L.....Minneapolis
Doyle, L. O.....Minneapolis
Drake, C. R.....Minneapolis
Drill, H. E.....Hopkins
Duff, E. R.....Minneapolis
Dukelow, D. A.....Minneapolis
Dumas, A. G.....Minneapolis
Dunlap, E. H.....Minneapolis
Dunn, G. R.....Minneapolis
Duryea, W. M.....Minneapolis

*Deceased
†Affiliate or Associate

†Dutton, C. E. ..... Minneapolis
Dvorak, B. A. ..... Minneapolis
Dwan, P. F. ..... Minneapolis
Dworsky, S. D. ..... Minneapolis
Ehrenberg, C. J. ..... Minneapolis
Ehrlich, S. P. ..... Minneapolis
Eich, Matthew ..... Minneapolis
Eisenstadt, D. H. ..... Minneapolis
Eitel, G. D. ..... Minneapolis
Ellison, D. E. ..... Minneapolis
Engelhart, P. C. ..... Minneapolis
Engstrand, O. J. ..... Minneapolis
*Erdmann, C. A. ..... Minneapolis
Erickson, R. F. ..... Minneapolis
Ericson, R. M. ..... Minneapolis
Evans, E. T. ..... Minneapolis
Evans, R. D. ..... Minneapolis
Fahr, G. E. ..... Minneapolis
Fansler, W. A. ..... Minneapolis
Feeney, J. M. ..... Minneapolis
Fenger, E. P. K. ..... Oak Terrace
Fetterly, Warren ..... Minneapolis
Fink, L. W. ..... Minneapolis
Fink, W. H. ..... Minneapolis
Fischer, M. S. ..... Minneapolis
†Fitzgerald, D. F. ..... Minneapolis
Fjeldstad, C. A. ..... Minneapolis
Fleming, A. S. ..... Minneapolis
Ford, W. H. ..... Minneapolis
Foster, W. K. ..... Minneapolis
Fowler, L. H. ..... Minneapolis
Frane, D. B. ..... Minneapoils
Fredericks, G. M. ..... Minneapolis
Friedell, Aaron ..... Minneapolis
Fritzell, K. E. ..... Minneapolis
Frost, J. B. ..... Minneapolis
Fuller, Alice H. ..... Minneapolis
Funk, V. K. ..... Oak Terrace
Galloway, J. B. ..... Minneapolis
Gammell, J. H. ..... Minneapolis
Gardner, E. L. ..... Minneapolis
Garten, J. L. ..... Minneapolis
Giere, E. O. ..... Minneapolis
Giere, J. C. ..... Minneapolis
Giere, R. W. ..... Minneapolis
†Giessler, P. W. ..... Minneapolis
Gilbert, M. G. ..... Minneapolis
Gilles, F. L. ..... Minneapolis
Gingold, B. A. ..... Minneapolis
Girvin, R. B. ..... Minneapolis
Golberg, M. L. ..... Minneapolis
Goldberg, I. M. ..... Minneapolis
Goldman, T. I. ..... Minneapolis
Goldner, M. Z. ..... Minneapolis
Good, H. D. ..... Minneapolis
Gordon, P. E. ..... Minneapolis
†Gratzek, F. R. ..... Minneapolis
Grave, Floyd ..... Minneapolis
Grimes, Marian ..... Minneapolis
Gronvall, P. R. ..... Minneapolis
Gunderson, N. A. ..... Minneapolis
Gushurst, E. G. ..... Minneapolis
Gustason, H. T. ..... Minneapolis
†Hacking, F. H. ..... Minneapolis
†Haggard, G. D. ..... Minneapolis
Hall, J. M. ..... Minneapolis
Hallberg, C. A. ..... Minneapolis
Hallock, Philip ..... Minneapolis
Hamel, A. L. ..... Minneapolis
*Hamilton, A. S. ..... Minneapolis
Hamlin, G. B. ..... Minneapolis
Hammerstad, L. M. ..... Minneapolis
Hammond, A. J. ..... Minneapolis
Hannah, H. B. ..... Minneapolis
Hansen, C. O. ..... Minneapolis
Hansen, E. W. ..... Minneapolis
Hansen, Olga S. ..... Minneapolis
Hanson, H. J. ..... Minneapolis
Hanson, H. V. ..... Minneapolis
Hanson, M. B. ..... Minneapolis
Hanson, W. A. ..... Minneapolis
Harrington, C. D. ..... Minneapolis
Harrington, F. E. ..... Minneapolis
Hart, V. L. ..... Minneapolis
†Hartzell, T. B. ..... Minneapolis
Hastings, D. R. ..... Minneapolis
Hauge, E. T. ..... Minneapolis
Haugen, J. A. ..... Minneapolis
Haven, W. K. ..... Minneapolis
†Haverfield, Addie R. ..... Minneapolis
Hawkinson, R. P. ..... Minneapolis
Hayes, J. M. ..... Minneapolis
Hays, A. T. ..... Minneapolis
Head, D. P. ..... Minneapolis
Head, G. D. ..... Minneapolis
Hedback, A. E. ..... Minneapolis
Heim, R. R. ..... Minneapolis
Hendricks, E. J. ..... Minneapolis
Hendrickson, J. F. ..... Minneapolis
Henrikson, E. C. ..... Minneapolis
†Henry, C. E. ..... Kirksville, Mo.
Henry, M. O. ..... Minneapolis
Herman, A. L. ..... Minneapolis
*Hiebert, J. P. ..... Minneapolis
Higgins, J. H. ..... Minneapolis
Hill, Eleanor J. ..... Minneapolis
Hillis, S. J. ..... Minneapolis
Hinckley, R. G. ..... Minneapolis
†Hirschfelder, A. D. ..... Minneapolis
Hirshfield, F. R. ..... Minneapolis
Hoaglund, A. W. ..... Minneapolis
†Hobbs, C. A. ..... Minneapolis
Hodge, S. V. ..... Minneapolis
Hoffert, H. E. ..... Minneapolis
Hoffman, R. A. ..... Minneapolis
Hoffman, W. L. ..... Minneapolis
†Holl, P. M. ..... Minneapolis
Holmberg, C. J. ..... Minneapolis
Holt, W. B. ..... Minneapolis
Holzapfel, F. C. ..... Minneapolis
Houkom, Bjarne ..... Minneapolis
Hovland, M. L. ..... Minneapolis
Hudson, G. E. ..... Minneapolis
Huenekens, E. J. ..... Minneapolis
Hultkrans, J. C. ..... Minneapolis
Hultkrans, R. E. ..... Minneapolis
Hurd, Annah ..... Minneapolis
Hutchinson, C. J. ..... Minneapolis
Hymes, Charles ..... Minneapolis
Hynes, J. E. ..... Minneapolis
Irvine, H. G. ..... Minneapolis
†Jackson, C. M. ..... Minneapolis
Jennings, Mary H. ..... Minneapolis
Jensen, Harry ..... Minneapolis
Jensen, M. J. ..... Minneapolis
Jensen, R. A. ..... Minneapolis
Johnson, A. B. ..... Minneapolis
Johnson, A. E. ..... Minneapolis
Johnson, E. W. ..... Minneapolis
Johnson, H. A. ..... Minneapolis
Johnson, J. A. ..... Minneapolis
Johnson, Julius ..... Minneapolis
†Johnson, N. A. ..... Minneapolis
Johnson, Norman ..... Minneapolis
Johnson, N. T. ..... Minneapolis
Johnson, R. A. ..... Minneapolis
Johnson, R. E. ..... Minneapolis
Johnson, Y. T. ..... Camp Claiborne, La.
Johnsrud, L. W. ..... Minneapolis
*Jones, G. M. ..... Minneapolis
*Jones, H. W. ..... Minneapolis
Jones, H. W., Jr. ..... Camp Claiborne, La.
Jones, W. R. ..... Minneapolis
Josewich, Alexander ..... Minneapolis
Kalin, O. T. ..... Minneapolis
Karlstrom, A. E. ..... Minneapolis
Kelby, G. M. ..... Minneapolis
Kennedy, C. C. ..... Minneapolis
Kennedy, Jane F. ..... Minneapolis
Kerkhof, A. C. ..... Minneapolis
Kertesz, G. ..... Minneapolis
Kibbe, O. A. ..... Minneapolis
†King, E. A. ..... Minneapolis
King, H. T. ..... Minneapolis
Kinsella, T. J. ..... Minneapolis
Kistler, A. J. ..... Minneapolis
Kistler, C. M. ..... Minneapolis
Knapp, M. E. ..... Minneapolis
Knight, R. R. ..... Minneapolis
Knight, R. T. ..... Minneapolis
Koepcke, G. M. ..... Minneapolis
Koller, H. M. ..... Minneapolis
Koller, L. R. ..... Minneapolis
Korchik, J. P. ..... Minneapolis
Koucky, R. W. ..... Minneapolis
Kucera, F. J. ..... Hopkins
Kucera, W. J. ..... Minneapolis
Lajoie, J. M. ..... Minneapolis
Lang, L. A. ..... Minneapolis
Lapierre, A. P. ..... Minneapolis
Lapierre, J. T. ..... Minneapolis
Larsen, F. W. ..... Minneapolis
Larson, C. M. ..... Minneapolis
Larson, Lawrence M. ..... Minneapolis
Larson, Leonard M. ..... Oak Terrace
Larson, P. N. ..... Minneapolis
La Vake, R. T. ..... Minneapolis
Laymon, C. W. ..... Minneapolis
Layne, J. A. ..... Minneapolis
Lazar, H. L. ..... Minneapolis
†Leavitt, H. H. ..... Minneapolis
Lebowske, J. A. ..... Minneapolis
Lee, H. M. ..... Minneapolis
Leland, H. R. ..... Minneapolis
Lenz, O. A. ..... Minneapolis
Leonard, L. J. ..... Minneapolis
Leonard, Sam ..... Minneapolis
Lillehei, E. J. ..... Robbinsdale
Lind, C. J. ..... Minneapolis
Lindberg, A. C. ..... Minneapolis
Lindberg, V. L. ..... Minneapolis
Lindquist, R. H. ..... Minneapolis
Linner, H. P. ..... Minneapolis
†Linton, W. B. ..... Minneapolis
Lippman, E. S. ..... Minneapolis
Lipschultz, Oscar ..... Minneapolis
Litchfield, J. T. ..... Minneapolis
Litman, A. B. ..... Minneapolis
Litzenberg, J. C. ..... Minneapolis
Logefeil, R. C. ..... Minneapolis
†Long, Jesse ..... Minneapolis
Loomis, E. A. ..... Minneapolis
Lowry, Elizabeth C. ..... Minneapolis
Lowry, Thomas ..... Minneapolis
Lufkin, N. H. ..... Minneapolis
Lundberg, Ruth I. ..... Minneapolis
Lundblad, R. A. ..... Minneapolis
Lundblad, S. W. ..... Minneapolis
Lundgren, A. C. ..... Minneapolis
Lundquist, E. F. ..... Minneapolis
Lynch, M. J. ..... Minneapolis
Lysne, Henry ..... Minneapolis
Lysne, Myron ..... Minneapolis
MacDonald, A. E. ..... Minneapolis
MacDonald, D. A. ..... Minneapolis
Mach, F. B. ..... Minneapolis
MacKinnon, D. C. ..... Minneapolis
Macnie, J. S. ..... Minneapolis
Maeder, E. C. ..... Minneapolis
Maland, C. O. ..... Minneapolis
Mariette, E. S. ..... Oak Terrace
Mark, D. B. ..... Minneapolis
Marking, G. H. ..... Osseo
Martinson, C. J. ..... Wayzata
†Matchan, G. R. ..... Minneapolis
Matthews, Justus ..... Minneapolis
Mattill, P. M. ..... Oak Terrace
Mattson, Hamlin ..... Minneapolis
Maxeiner, S. R. ..... Minneapolis
May, W. H. ..... Minneapolis
McCarthy, Donald ..... Minneapolis
McCartney, J. S. ..... Minneapolis
McDaniel, Orianna ..... Minneapolis
McFarland, A. H. ..... Minneapolis
McGandy, R. F. ..... Minneapolis
McGeary, G. E. ..... Minneapolis
McInerny, M. W. ..... Minneapoils
†McIntyre, George ..... San Marino, Calif.
McKelvey, J. L. ..... Minneapolis
McKenzie, C. H. ..... Minneapolis
McKinlay, C. A. ..... Minneapolis
McKinley, J. C. ..... Minneapolis
McKinney, F. S. ..... Minneapolis
McLennan, C. E. ..... Minneapolis
McPheeters, H. O. ..... Minneapolis
†McQuarrie, Irvine ..... Minneapolis
Meland, E. L. ..... Minneapolis
Merkert, C. E. ..... Minneapolis
Merkert, G. L. ..... Minneapolis
†Merrill, Elisabeth ..... Minneapolis
Meyer, E. L. ..... Minneapolis
Michael, J. C. ..... Minneapolis
Michel, H. H. ..... Minneapolis
Michelson, H. E. ..... Minneapolis
Miller, H. E. ..... Minneapolis
Miller, Hugo E. ..... Minneapolis
Miller, J. C. ..... Minneapolis
Milton, J. S. ..... Minneapolis
Minsky, A. A. ..... Minneapolis
Mitchell, E. C. ..... Mound
Moe, J. H. ..... Minneapolis
Moen, J. K. ..... Minneapolis
Moir, W. W. ..... Minneapolis
Monson, E. M. ..... Minneapolis
Moren, Edward ..... Minneapolis
Moriarty, Cecile R. ..... St. Paul
Morrison, A. W. ..... Minneapolis
Morrison, Charlotte J. ..... Minneapolis
Morse, R. W. ..... Minneapolis
Murphy, E. P. ..... Minneapolis
Murphy, I. J. ..... Minneapolis
Myers, J. A. ..... Minneapolis
Neary, R. P. ..... Minneapolis
†Nelson, H. S. ..... Excelsior
Nelson, Harvey ..... Minneapolis
Nelson, O. L. N. ..... Minneapolis
Nelson, W. I. ..... Minneapolis
Nessa, C. B. ..... St. Cloud
Newhart, Horace ..... Minneapolis
Noonan, W. J. ..... Ft. Leonard Wood, Mo.
Nordin, G. T. ..... Minneapolis
Nordland, Martin ..... Minneapolis
Noth, H. W. ..... Minneapolis
Nydahl, M. J. ..... St. Paul
Nylander, E. G. ..... Minneapolis
Nystrom, Ruth ..... Minneapolis
Oberg, C. M. ..... Minneapolis
†O'Brien, W. A. ..... Minneapolis
O'Donnell, J. E. ..... Minneapolis
Olsen, E. G. ..... Minneapolis
Olson, A. C. ..... Minneapolis
Olson, F. A. ..... Minneapolis
Olson, O. A. ..... Minneapolis

*Deceased.
†Affiliate or Associate

Olson, R. G.....Minneapolis
Oppen, E. G.....Minneapolis
Owre, Oscar.....Minneapolis
Paine, J. R.....Minneapolis
Patterson, W. E.....Minneapolis
Pederson, R. M.....Minneapolis
Pennington, Reuben.....Minneapolis
Peppard, T. A.....Minneapolis
Petersen, J. R.....Minneapolis
Petersen, Thorvald.....Minneapolis
Peterson, Henry.....Minneapolis
Peterson, H. W.....Minneapolis
Peterson, N. P.....Minneapolis
Peterson, O. H.....Minneapolis
Peterson, P. E.....Minneapolis
Peterson, W. C.....Minneapolis
Petit, L. J.....Minneapolis
Pewters, J. T.....Minneapolis
Peyton, W. T.....Minneapolis
Pfunder, M. C.....Minneapolis
Phelps, K. A.....Minneapolis
Platou, E. S.....Minneapolis
Pohl, J. F.....Minneapolis
Pollard, D. W.....Minneapolis
Pollock, D. K.....Minneapolis
Polzak, J. A.....Minneapolis
Poppe, F. H.....Minneapolis
Potter, R. B.....Minneapolis
Pratt, F. J.....Minneapolis
Pratt, J. A.....Minneapolis
Preine, I. A.....Minneapolis
Prim, J. A.....Minneapolis
Proshek, C. E.....Minneapolis
Quello, R. O. B.....Minneapolis
†Quinby, T. F.....Minneapolis
Quist, H. W.....Minneapolis
Rasmussen, R. C.....Minneapolis
Reed, C. A.....Minneapolis
Regnier, E. A.....Minneapolis
Rewbridge, A. G.....Minneapolis
Reynolds, J. S.....Minneapolis
Rice, C. O.....Minneapolis
Richardson, F. S.....Minneapolis
Richdorf, L. F.....Minneapolis
Rieke, W. W.....Wayzata
Rigler, L. G.....Minneapolis
Risch, R. E.....Minneapolis
*Rishmiller, J. H.....Minneapolis
Rizer, R. I.....Minneapolis
Roan, C. M.....Minneapolis
Robb, E. F.....Minneapolis
Robbins, O. F.....Minneapolis
Roberts, L. J.....Minneapolis
Roberts, S. W.....Minneapolis
Roberts, T. S.....Minneapolis
Roberts, W. B.....Minneapolis
Robitshek, E. C.....Minneapolis
Rochford, W. E.....Minneapolis
Rodda, F. C.....Minneapolis
Rosen, Samuel.....Minneapolis
Rosenwald, R. M.....Minneapolis
Roskilly, G. C. P.....Minneapolis
Ross, A. J.....Minneapolis
Rucker, W. H.....Minneapolis
Rud, N. E.....Minneapolis
Rudell, G. L.....Minneapolis
Russeth, A. N.....Minneapolis
Rusten, E. M.....Minneapolis
Sadler, W. P.....Minneapolis
St. Cyr, K. J.....Osseo
Salt, C. G.....Minneapolis
Samuelson, Samuel.....Minneapolis
Sandell, S. T.....Oak Terrace
Sandt, K. E.....Minneapolis
Sawatzky, W. A.....Minneapolis
Schaaf, F. H. K.....Minneapolis
Schaefer, W. G.....Minneapolis
†Scheldrup, N. H.....Minneapolis
Scherer, L. R.....Minneapolis
Schiele, B. C.....Minneapolis
Schmidt, G. F.....Camp Claiborne, La.
†Schmitt, A. F.....Minneapolis
†Schmitt, S. C.....Los Angeles, Calif.
†Schneider, J. P.....Minneapolis
Schneidman, N. R.....Minneapolis
Schottler, M. E.....Minneapolis
Schultz, P. J.....Minneapolis
†Schussler, O. F.....Minneapolis
Schwartz, V. J.....Minneapolis
†Schwyzer, Gustav .....Minneapolis
†Scott, F. H.....Minneapolis
Scott, H. G.....Minneapolis
Seashore, Gilbert.....Minneapolis
Seham, Max.....Minneapolis
Seifert, M. H.....Excelsior
Seljeskog, S. R.....Minneapolis
Selleseth, I. F.....Minneapolis
Sessions, J. C.....Minneapolis
Shaperman, Eva P.....Minneapolis
Shapiro, M. J.....Minneapolis
Sharp, D. V.....Minneapolis
Siegmann, W. C.....Minneapolis
Silver, J. D.....Minneapolis
Simons, J. H.....Minneapolis
Simonson, D. B.....Minneapolis
Simpson, E. D.....Minneapolis
Sinykin, M. B.....Minneapolis
Siperstein, D. M.....Minneapolis
†Sivertsen, Andrew ....Tarzana, Calif.
Sivertsen, Ivar.....Minneapolis
Skjold, A. C.....Minneapolis
Sloan, Julius.....Minneapolis
Smisek, F. M.....Minneapolis
Smith, A. E.....Minneapolis
Smith, A. M.....Minneapolis
Smith, Archie M.....Minneapolis
Smith, H. R.....Minneapolis
Smith, Margaret I.....Minneapolis
Smith, N. M.....Minneapolis
Soderlind, R. T.....Minneapolis
Solhaug, S. B.....Minneapolis
Spano, J. P.....Minneapolis
Sperling, Louis.....Minneapolis
Spink, W. W.....Minneapolis
Spratt, C. N.....Minneapolis
Stanford, C. E.....Minneapolis
Stebbins, T. L.....Minneapolis
Stein, K. E.....Lakeville
Stelter, L. A.....Minneapolis
Stenstrom, Annette T.....Minneapolis
Stewart, C. A.....Minneapolis
Stewart, R. I.....Minneapolis
Stoesser, A. V.....Minneapolis
†Stomel, Joseph...Los Angeles, Calif.
Strachauer, A. C.....Minneapolis
Stromgren, D. T.....Minneapolis
Strout, G. E.....Minneapolis
Sturre, J. R.....Minneapolis
Sullivan, R. M.....Minneapolis
Sullivan, R. R.....Minneapolis
Sundt, Mathias.....Minneapolis
Swanson, Cephas.....Minneapolis
Swanson, R. E.....Minneapolis
Sweetser, H. B., Jr.....Minneapolis
†Sweetser, H. B., Sr.....Minneapolis
Sweetser, T. H.....Minneapolis
Sweitzer, S. E.....Minneapolis
Swendseen, C. G.....Minneapolis
Taylor, J. H.....Minneapolis
Thomas, G. E.....Minneapolis
Thomas, G. H.....Minneapolis
Thomas, G. J.....Minneapolis
Thysell, D. M.....Minneapolis
Tingdale, A. C.....Minneapolis
Trueman, H. S.....Minneapolis
Tunstead, H. J.....Minneapolis
Turnacliff, D. D.....Minneapolis
*Tyrrell, C. C.....Minneapolis
Ude, W. H.....Minneapolis
Ulrich, H. L.....Minneapolis
Undine, C. A.....Minneapolis
Vik, A. E.....Minneapolis
Wahlquist, H. F.....Minneapolis
Walch, A. E.....Minneapolis
Waldron, C. W.....Minneapolis
Wall, C. R.....Minneapolis
Walsh, W. T.....Minneapolis
Wangensteen, O. H.....Minneapolis
Wanous, E. Z.....Minneapolis
Ward, A. W.....Minneapolis
Ward, P. A.....Minneapolis
*Warham, T. T.....Minneapolis
Watson, C. J.....Minneapolis
Webb, R. C.....Minneapolis
Weisman, S. A.....Minneapolis
Wethall, A. G.....Minneapolis
Wetherby, Macnider.....Minneapolis
Weum, T. W.....Minneapolis
White, A. A.....Minneapolis
White, S. M.....Minneapolis
White, W. D.....Minneapolis
Whitesell, L. A.....Minneapolis
Widen, W. F.....Minneapolis
Wilcox, A. E.....Minneapolis
Wilder, K. W.....Minneapolis
Wilder, R. L.....Minneapolis
Wilken, P. A.....Minneapolis
Willcutt, C. E.....Minneapolis
Williams, Robert.....Minneapolis
Winer, L. H.....Minneapolis
Winther, Nora M. C.....Minneapolis
Wipperman, F. F.....Minneapolis
Witham, C. A.....Minneapolis
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Woodworth, Elizabeth.....Minneapolis
*Wright, C. B.....Minneapolis
†Wright, C. D.....Minneapolis
*Wright, F. R.....Minneapolis
Wright, S. G.....Minneapolis
Wright, W. S.....Minneapolis
Wynne, H. M. N.....Minneapolis
Ylvisaker, R. S.....Minneapolis
Yoerg, O. W.....Minneapolis
Zaworski, E. A.....Minneapolis
Zierold, A. A.....Minneapolis
Ziskin, Thomas.....Minneapolis

KANDIYOHI-SWIFT-MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, second Wednesday of month
Annual meeting, December
Number of Members: 33

President
Johnson, Hans .....Kerkhoven

Secretary
Scofield, C. L.....Benson

Anderson, R. E.....Willmar
Arnson, J. M.....Benson
Branton, A. F.....Willmar
Branton, B. J.....Willmar
Brigham, Frank.....Watkins
Daignault, Oscar.....Benson
Danielson, K. A.....Litchfield
Danielson, Lennox.....Litchfield
Dowswell, W. J.....Kerkhoven
Feinstein, J. Y.....Grove City
Frederickson, Alice C.....Willmar
Frederickson, G. U. Y.....Willmar
Frisch, F. P.....Willmar
Frost, E. H.....Willmar
Giere, S. W.....Benson
Gilman, L. C.....Atwater
Hodapp, R. J.....Willmar
Jacobs, D. L.....Willmar
Jacobs, J. C.....Willmar
Johnson, Hans.....Kerkhoven
Johnson, J. W.....Kerkhoven
Kaufman, E. J.....Appleton
Lutz, E. H.....Willmar
Macklin, W. E.....Litchfield
O'Connor, D. C.....Eden Valley
Petersen, M. C.....Willmar
Proeschel, R. K.....Willmar
Scofield, C. L.....Benson
Sellers, G. K.....Dassel
Solsem, F. N.....Spicer
Telford, V. J.....Litchfield
Wilmot, C. A.....Litchfield
Wilmot, H. E.....Litchfield

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday of month
Annual meeting, Last Tuesday in October
Number of Members: 22

President
Smith, L. A.....Balaton

Secretary
Workman, W. G.....Tracy

Bossingham, O. N.....Lake Benton
Ford, B. C.....Marshall
Frank, J. E.....Marshall
Friedell, George .....Ivanhoe
Germo, Charles.....Balaton
Gray, F. D.....Marshall
Gray, R. F.....Marshall
Henry, M. R.....Cottonwood
Hermanson, P. E.....Hendricks
Hoidale, A. D.....Tracy
Jacquot, G. L.....Marshall
Johnson, P. C.....Tyler
Monson, L. J.....Canby
Purves, G. H.....Lake Benton
†Robertson, J. B.....Minneapolis
Smith, L. A.....Balaton
Thompson, C. O.....Hendricks
Vadheim, A. L.....Tyler
Valentine, W. H.....Tracy
Wolstan, S. D.....Minneota
Workman, W. G.....Tracy
Yaeger, W. W.....Marshall

*Deceased
†Affiliate or Associate

McLEOD COUNTY MEDICAL SOCIETY

Regular meetings, six times a year at call
Annual meeting, January
Number of Members: 17

President
Holm, H. H. ..... Glencoe

Secretary
Kallestad, L. L. ..... Hutchinson

Clement, J. B. ..... Lester Prairie
Goss, H. C. ..... Glencoe
Holm, H. H. ..... Glencoe
*Jensen, A. H. ..... Hutchinson
Jensen, A. M. ..... Brownton
Kallestad, L. L. ..... Hutchinson
Klima, W. W. ..... Stewart
Lippmann, E. W. ..... Hutchinson
McMahon, M. J. ..... Green Isle
Ninneman, N. N. ..... Silver Lake
Sahr, W. G. ..... Hutchinson
Schmidt, W. R. ..... Glencoe
Scholpp, O. W. ..... Hutchinson
Sheppard, C. G. ..... Hutchinson
†Sheppard, Fred ..... Hutchinson
†Sheppard, P. E. ..... Hutchinson
†Tinker, C. W. ..... Stewart
Trutna, T. J. ..... Silver Lake

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of each month
Annual meeting, November
Number of Members: 27

President
Morrow, J. J. ..... Austin

Secretary
Leck, P. C. ..... Austin

*Allen, A. W. ..... Austin
Allen, C. C. ..... Austin
Allen, H. B. ..... Austin
Anderson, D. P., Jr. ..... Austin
Cronwell, B. J. ..... Austin
Eckdale, J. E. ..... Lyle
Eckhardt, C. L. ..... Austin
Flanagan, L. G. ..... Austin
Grise, W. B. ..... Austin
Havens, J. G. W. ..... Austin
Hegge, O. H. ..... Austin
Hegge, R. S. ..... Austin
Henslin, A. E. ..... Le Roy
Hertel, G. E. ..... Austin
Leck, P. C. ..... Austin
Lommen, P. A. ..... Austin
McKenna, J. K. ..... Austin
Melzer, G. R. ..... Lyle
Mitchell, R. S. ..... Grand Meadow
Morrow, J. J. ..... Austin
Morse, M. P. ..... Le Roy
Robertson, P. A. ..... Austin
Rosenthal, F. H. ..... Grand Meadow
Schneider, P. J. ..... Adams
Schottler, G. J. ..... Dexter
Sheedy, C. L. ..... Austin
Sher, D. A. ..... Minneapolis
Thomson, J. M. ..... Brownsdale

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, March, September, and December
Annual meeting, December
Number of Members: 25

President
Traxler, F. J. ..... Henderson

Secretary
Strathern, C. S. ..... St. Peter

Aitkens, H. B. ..... Le Center
Covell, W. W. ..... St. Peter
Curtis, R. A. ..... Le Center
Ericson, Swan ..... Le Sueur
Freeman, G. H. ..... St. Peter
Hiniker, P. J. ..... Le Sueur
Holtan, Theodore ..... Waterville
Johnson, H. C. ..... North Mankato
Kerschbaumer, Luisa ..... St. Peter
Kolars, J. J. ..... Le Center
Larson, M. H. ..... Nicollet
Lenander, M. E. ..... St. Peter
Miller, E. W. ..... St. Peter
Nilson, H. J. ..... North Mankato
Nissen, A. S. ..... St. Peter
Olmanson, E. G. ..... St. Peter
Olson, D. C. ..... Gaylord
Rossen, R. X. ..... Hastings
Sonnesyn, N. N. ..... Le Sueur
Strathern, C. S. ..... St. Peter
Strathern, F. P. ..... St. Peter
Traxler, F. J. ..... Henderson
Wohlrabe, C. F. ..... North Mankato
Wolner, O. H. ..... St. Peter
Woodworth, L. F. ..... Le Center

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Regular meetings, first Wednesday every odd month
Annual meeting, November
Number of Members: 440

President
Hempstead, B. E. ..... Rochester

Secretary
Anderson, M. J. ..... Rochester

Adams, R. C. ..... Rochester
Adson, A. W. ..... Rochester
Affeldt, D. E. ..... Kasson
Ahlfs, Jacob ..... Caledonia
Aita, J. A. ..... Rochester
Albers, G. D. ..... Rochester
Allen, E. V. ..... Rochester
Alvarez, W. C. ..... Rochester
Amberg, Samuel ..... Rochester
Anderson, B. M. ..... Rochester
Anderson, C. D. ..... Rochester
Anderson, M. J. ..... Rochester
Autry, D. H. ..... Little Rock, Ark.
Baggenstoss, A. H. ..... Rochester
Bair, H. L. ..... Rochester
Baker, G. S. ..... Rochester
Baker, H. R. ..... Hayfield
Baker, R. L. ..... Hayfield
Baker, Theodore, Jr. ..... Rochester
Balfour, D. C. ..... Rochester
Bargen, J. A. ..... Rochester
Barker, N. W. ..... Rochester
Barnes, A. R. ..... Rochester
Barrett, R. H. ..... Rochester
Basom, W. C. ..... Rochester
Beard, Crowell ..... Rochester
Beck, N. R. ..... Rochester
Beizer, L. H. ..... Rochester
Belote, G. B. ..... Caledonia
Benedict, W. L. ..... Rochester
Benson, R. E. ..... Rochester
Berkman, D. M. ..... Rochester
Berkman, J. M. ..... Rochester
Bickel, W. H. ..... Rochester
Bigelow, C. E. ..... Dodge Center
Binger, M. W. ..... Rochester
Birge, R. F. ..... Rochester
Black, B. M. ..... Rochester
Blackwell, W. J. ..... Rochester
Boothby, W. M. ..... Rochester
Bowing, H. H. ..... Rochester
Braasch, W. F. ..... Rochester
Broders, A. C. ..... Rochester
Brown, A. E. ..... Rochester
Brown, G. E., Jr. ..... Pine City
Brown, H. A. ..... Rochester
Brown, H. O. ..... Rochester
Brown, J. R. ..... Rochester
Brown, M. H. ..... Rochester
Brown, P. W. ..... Rochester
Browne, H. C., Jr. ..... Rochester
Brunsting, L. A. ..... Rochester
Buie, L. A. ..... Rochester
Burchell, H. B. ..... Rochester
Burks, J. W., Jr. ..... Rochester
Butt, H. R. ..... Rochester
Camp, J. D. ..... Rochester
Campbell, D. C. ..... Rochester
Campbell, J. R. ..... Rochester
Canfield, W. W. ..... Houston
Carryer, H. M. ..... Rochester
Catinella, P. J. ..... Rochester
Chapman, A. S. ..... Rochester
Christensen, B. H. ..... Rochester
Clagett, O. T. ..... Rochester
Clark, L. W. ..... Spring Valley
Clegg, R. S. ..... Rochester
Cleveland, W. H. ..... Rochester
Clifton, T. A. ..... Chatfield
Comfort, M. W. ..... Rochester
Condon, W. B. ..... Rochester
†Conner, H. M. ..... Rochester
Cook, E. N. ..... Rochester
Counseller, V. S. ..... Rochester
Coventry, M. B. ..... Rochester
Cragg, R. W. ..... Rochester
Craig, W. McK. ..... Rochester
Crenshaw, J. L. ..... Rochester
Crewe, J. E. ..... Rochester
Crumpacker, L. K. ..... Rochester
Cunningham, B. P. ..... Rochester
Currens, J. H. ..... Rochester
Cusick, P. L. ..... Rochester
Darling, J. P. ..... Des Moines, Ia.
Davies, L. T. ..... Rochester
Davis, A. C. ..... Rochester
Davis, I. G. ..... Rushford
Day, Lois ..... Rochester
Dearing, W. H. ..... Rochester
Desjardins, A. U. ..... Rochester
Dix, C. R. ..... Rochester
Dixon, C. F. ..... Rochester
Dockerty, M. B. ..... Rochester
Doehring, P. C. ..... New Orleans, La.
Dolder, F. C. ..... Eyota
Donald, C. J., Jr. ..... Rochester
Dorton, H. E. ..... Rochester
†Drake, F. A. ..... Lanesboro
Drapiewski, J. F. ..... Rochester
Drips, Della G. ..... Rochester
Dry, T. J. ..... Rochester
Eaton, L. McK. ..... Rochester
Eginton, C. T. ..... Rochester
Ehni, G. J. ..... Rochester
Elkins, E. C. ..... Rochester
Emmett, J. L. ..... Rochester
English, J. P. ..... Rochester
Erich, J. B. ..... Rochester
Erickson, C. O. ..... Rochester
Erickson, E. W. ..... Minneapolis
Evarts, A. B. ..... Rochester
Eusterman, G. B. ..... Rochester
Faber, J. E. ..... Rochester
Feldman, F. M. ..... Rochester
Fenstermacher, R. H. ..... Rochester
Ferguson, F. F. ..... Rochester
Ferguson, W. J., Jr. ..... Rochester
Ferris, D. O. ..... Rochester
Figi, F. A. ..... Rochester
Fishback, C. F. ..... Rochester
Fogarty, C. W., Jr. ..... Rochester
Foster, M. A. ..... Rochester
Fricke, R. E. ..... Rochester
Friedall, M. T. ..... Rochester
Gaarde, F. W. ..... Rochester
Gambill, E. E. ..... Rochester
Ghormley, R. K. ..... Rochester
Giffin, H. M. ..... Rochester
Giffin, H. Z. ..... Rochester
Giffin, L. A. ..... Alton, Ill.
Glomset, D. A. ..... Rochester
Golden, R. F. ..... Rochester
Good, C. A., Jr. ..... Rochester
Gore, H. R. ..... Rochester
Grandy, A. Margaret, ... Rochester
Grant, Russel ..... Rochester
Gray, H. K. ..... Rochester
Greene, L. F. ..... Rochester
Grinnell, W. B. ..... Preston

*Deceased
†Affiliate or Associate

Groff, J. E. ..... Rochester
Habein, H. C. ..... Rochester
Haines, S. F. ..... Rochester
Haisten, A. S. ..... Rochester
Hall, B. E. ..... Rochester
Hallenbeck, D. F. ..... Rochester
Hallenbeck, G. A. ..... Rochester
Hammer, H. J. ..... Detroit, Mich.
Hampton, H. P. ..... Rochester
Hargraves, M. M. ..... Rochester
Harley, R. D. ..... Rochester
Harper, H. P. ..... Rochester
Harper, S. B. ..... Rochester
Harrington, S. W. ..... Rochester
Hartman, H. R. ..... Rochester
Hausmann, P. F. ..... Rochester
Havens, F. Z. ..... Rochester
Hayden, R. O. ..... Rochester
Heck, F. J. ..... Rochester
Heersema, P. H. ..... Rochester
Heilman, Charles ..... Rochester
Heilman, Dorothy M. H. ..... Rochester
Heilman, F. R. ..... Rochester
Helland, G. M. ..... Spring Grove
Helland, J. W. ..... Spring Grove
Helmholz, H. F. ..... Rochester
Hempstead, B. E. ..... Rochester
Hench, P. S. ..... Rochester
Henderson, J. W. ..... Rochester
Henderson, M. S. ..... Rochester
Herrell, W. E. ..... Rochester
Hewitt, Edith S. ..... Rochester
†Hewitt, R. M. ..... Rochester
†Heyerdale, O. C. ..... Rochester
Heyerdale, W. W. ..... Rochester
Higginson, J. F. ..... Rochester
Hildebrand, Alice G. ..... Rochester
Hill, J. R. ..... Rochester
Hines, E. A., Jr. ..... Rochester
Hinshaw, H. C. ..... Rochester
Hoffmann, H. O. E. ..... Rochester
Horton, B. T. ..... Rochester
Howe, R. F. ..... Rochester
Howell, L. P. ..... Rochester
Hughes, T. J. ..... Rochester
Hummer, G. J. ..... Rochester
Hunt, A. B. ..... Rochester

Iverson, R. M. ..... Rochester
Ivie, J. McK. ..... Rochester

Jackman, R. J. ..... Rochester
Jacobson, C. E., Jr. ..... Rochester
Johnson, H. P. ..... Harmony
Johnson, R. B. ..... Lanesboro
Joss, C. S. ..... Rochester
Joyce, G. L. ..... Rochester
Judd, D. B. ..... Rochester
Judd, E. S. ..... Rochester
Jump, W. C. ..... Kasson

Kapernick, J. S. ..... Rochester
Keating, F. R., Jr. ..... Rochester
Keith, H. M. ..... Rochester
Keith, N. M. ..... Rochester
Kelsey, N. P. ..... Rochester
Kennedy, R. L. J. ..... Rochester
Kent, R. N. ..... Rochester
Kepler, E. J. ..... Rochester
Kernohan, J. W. ..... Rochester
Kibler, J. M. ..... Lakeland, Fla.
Kierland, R. R. ..... Rochester
Killins, J. A. ..... Rochester
King, H. E. ..... Rochester
King, W. L. M. ..... Rochester
Kirklin, B. R. ..... Rochester
Kirklin, O. L. ..... Rochester
Koelsche, G. A. ..... Rochester
Krusen, F. H. ..... Rochester
Kvale, W. F. ..... Rochester
Kyser, F. A. ..... Rochester

Lander, H. H. ..... Rochester
Lannin, J. C. ..... Mabel
Leary, W. V. ..... Rochester
Leddy, E. T. ..... Rochester
Lehnhoff, H. J., Jr. ..... Rochester
Lemon, W. S. ..... Rochester
Lien, R. J. ..... Rochester
Lillie, H. I. ..... Rochester
Lindahl, W. W. ..... Rochester
Little, A. G. ..... Rochester
Little, E. H. ..... Rochester
Lipscomb, P. R. ..... Rochester
†Lochead, D. C. ..... Rochester
Logan, A. H. ..... Rochester
Logan, G. B. ..... Rochester
Love, J. G. ..... Rochester
Love, W. R. ..... Rochester
Lovelace, W. R. ..... Rochester
Lovelady, S. B. ..... Rochester
Lovering, Joseph ..... Rochester
Luckey, C. A. ..... Rochester
Lueck, A. G. ..... Rochester
Lundy, J. S. ..... Rochester
Luden, Georgine ..... Victoria, B. C., Can.
Lyman, R. W. ..... Rochester
Lynch, R. C. ..... Rochester

†MacCarty, W. C. ..... Rochester
MacCarty, W. C., Jr. ..... Rochester
Macey, H. B. ..... Rochester
MacKay, A. R. ..... Spokane, Wash.
MacKay, H. J. ..... Rochester
MacLean, A. R. ..... Rochester
Madding, G. F. ..... Rochester
Mader, J. W., Jr. ..... Rochester
Magath, T. B. ..... Rochester
Maino, C. R. ..... Rochester
†Mann, F. C. ..... Rochester
Masson, D. M. ..... Rochester
Masson, J. C. ..... Rochester
Mayo, C. W. ..... Rochester
Maytum, C. K. ..... Rochester
McCall, C. H. ..... Rochester
McCallig, J. J. ..... Rochester
McCannel, D. A. ..... Rochester
McCullough, J. A. L. ..... Rochester
McDonald, J. R. ..... Rochester
McDonough, F. E. ..... Rochester
McHeffey, G. J. ..... Billings, Mont.
McKaig, C. B. ..... Pine Island
McKinnon, D. A., Jr. ..... Rochester
McLoughlin, C. J. ..... Rochester
McManamy, E. P. ..... Rochester
Mead, F. B. ..... Rochester
Merritt, W. A. ..... Rochester
Meyerding, H. W. ..... Rochester
Miller, J. R., Jr. ..... Rochester
Moersch, F. P. ..... Rochester
Moersch, H. J. ..... Rochester
Montgomery, Hamilton ..... Rochester
Morissette, Leopold ..... Rochester
Morlock, C. G. ..... Rochester
Mountain, G. E. ..... Rochester
Mousel, L. H. ..... Rochester
Movius, A. J., Jr. ..... Rochester
Mulmed, E. I. ..... Rochester
Mussey, R. D. ..... Rochester

Nass, H. A. ..... Mabel
Neel, R. M. ..... Rochester
Nehring, J. P. ..... Preston
Nesbitt, Samuel ..... Rochester
New, G. B. ..... Rochester
Nichols, D. R. ..... Rochester
Nickel, W. R. ..... Rochester
Norris, N. T. ..... Caledonia

O'Brien, J. P. ..... Rochester
Odel, H. M. ..... Rochester
O'Leary, P. A. ..... Rochester
Olsen, A. M. ..... Rochester
Olson, E. A. ..... Pine Island
Olson, G. E. ..... West Concord
Olson, S. W. ..... Rochester
Onsgard, L. K. ..... Houston

Parker, R. L. ..... Rochester
Parkhill, Edith M. ..... Rochester
Pastore, P. N. ..... Rochester
Pattison, D. H. ..... Rochester
Paulson, D. L. ..... Rochester
Paulson, J. A. ..... Rochester
Pearson, C. C. ..... Rochester
Pemberton, J. deJ. ..... Rochester
Pender, J. W. ..... Rochester
Pennington, R. E. ..... Rochester
Peters, G. A. ..... Rochester
Peterson, W. G. ..... Rochester
Phalen, G. S. ..... Rochester
Piper, M. C. ..... Rochester
Plimpton, N. C., Jr. ..... Rochester
Plummer, W. A. ..... Rochester
Pollock, L. W. ..... Rochester
Polmeteer, F. E. ..... Rochester
Pool, T. L. ..... Rochester
Popp, W. C. ..... Rochester
Powers, F. H. ..... Rochester
Prangen, A. D. ..... Rochester
Pratt, J. H., Jr. ..... Rochester
Prickman, L. E. ..... Rochester
Priestley, J. T. ..... Rochester
Pruitt, R. D. ..... Rochester
Prunty, F. C. ..... Rochester
Pugh, D. G. ..... Rochester

Quick, E. D. ..... Riverside, Calif.

Randall, K. C., II ..... Lafayette, Ind.
Randall, L. M. ..... Rochester
Rasmussen, W. C. ..... Rochester
Raszkowski, H. J. ..... Rochester
Redding, M. D. ..... Rochester
Reeser, Richard, Jr. ..... Rochester
Rein, G. N. ..... Benton Harbor, Mich.
Richardson, R. J. ..... Rushford
Richardson, W. E. ..... Rushford
Rigos, F. J. ..... Rochester
Risser, A. F. ..... Stewartville
Rivers, A. B. ..... Rochester
Robertson, H. E. ..... Rochester
Robinson, F. J. ..... Rochester
Rogers, A. M. ..... Rochester
Rogne, W. G. ..... Spring Grove
Root, G. T. ..... Rochester
Rosenbaum, E. E. ..... Rochester
Rosenberg, E. F. ..... Rochester
Rosenow, E. C. ..... Rochester
Rucker, C. W. ..... Rochester
Rutledge, D. I. ..... Rochester
Rynearson, E. H. ..... Rochester

Sanford, A. H. ..... Rochester
Sayre, G. P. ..... Rochester
Scheifley, C. H. ..... Rochester
Schlicke, C. P. ..... Rochester
Schmidt, H. W. ..... Rochester
Schmitt, G. F., Jr. ..... Rochester
Schneider, H. H. ..... Fresno, Calif.
Schulte, T. L. ..... San Francisco, Calif.
Schunke, G. B. ..... Rochester
Schwartz, E. R. ..... Stewartville
Schweiger, L. R. ..... Rochester
Sealy, W. B. ..... Rochester
Seldon, T. H. ..... Rochester
Sharpe, W. S. ..... Rochester
Shelden, W. D. ..... Rochester
Shepard, V. D. ..... Rochester
Shick, R. M. ..... Rochester
Simonton, K. M. ..... Rochester
Skaug, H. M. ..... Chatfield
Slocumb, C. H. ..... Rochester
Sluder, F. S., Jr. ..... Rochester
Smedal, H. A., Jr. ..... Rochester
Smith, B. F. ..... Rochester
Smith, F. D. ..... Rochester
Smith, F. A. ..... Rochester
Smith, F. L. ..... Rochester
Smith, H. L. ..... Rochester
Smith, L. A. ..... Rochester
Smith, N. D. ..... Rochester
Smith, R. L., Jr. ..... Rochester
Snell, A. M. ..... Rochester
Snyder, J. M. ..... Denver, Colo.
Soniat, T. L. L. ..... New Orleans, La.
Sprague, R. G. ..... Rochester
Stafford, D. E. ..... Rochester
Standard, W. P. ..... Rochester
Stevenson, W. D., Jr. ..... Rochester
Stickney, J. M. ..... Rochester
Stover, Lee ..... Rochester
Stroebel, C. F., Jr. ..... Rochester
Strom, G. W. ..... Rochester
Stuhler, L. G. ..... Rochester
Sutherland, C. G. ..... Rochester
Tenner, R. J. ..... Rochester
Tennison, William, III ..... Rochester
Thompson, G. J. ..... Rochester
Tierney, C. M. ..... Harmony
Tischer, E. P. ..... Rochester
Tillisch, J. H. ..... Rochester
Trandem, C. Elinor ..... Rochester
Tuohy, E. B. ..... Rochester
Twyman, R. A. ..... Rochester

Uihlein, Alfred ..... Rochester

Vadheim, J. L. ..... Rochester
Van Demark, R. E. ..... Rochester
Vaughn, L. D. ..... Rochester

Wagener, H. P. ..... Rochester
Wakefield, E. G. ..... Rochester
Walsh, M. N. ..... Rochester
Walters, Waltman ..... Rochester
Watkins, C. H. ..... Rochester
Waugh, J. M. ..... Rochester
Weber, H. M. ..... Rochester
Weir, J. F. ..... Rochester
Weisel, Wilson ..... Rochester
Weismann, R. E. ..... Rochester
Wiig, L. M. ..... Rochester
Wilcox, L. E. ..... Rochester
Wilder, R. M. ..... Rochester
Williams, H. L. ..... Rochester
Williams, R. D. ..... Rochester
Williams, R. V. ..... Rushford
Willius, F. A. ..... Rochester
Willson, D. M. ..... Rochester
Wilson, J. W. ..... Rochester
Wilson, L. B. ..... Rochester
Wilson, R. B. ..... Rochester
Wilson, W. H. ..... Rochester
Wise, R. W. E. ..... Rochester
Wollaeger, E. E. ..... Rochester
Woltman, H. W. ..... Rochester
Wood, B. J. ..... Rochester
Wood, H. G. ..... Rochester
Wood, W. W., Jr. ..... Rochester
Woodruff, C. W. ..... Chatfield
Woodruff, Robert ..... Denver, Colo.
Woods, R. M. ..... Rochester
Wozencraft, J. P. ..... Rochester
Wulf, R. F. ..... Rochester
Wyrens, R. G. ..... Rochester

Yeager, C. L. ..... Rochester
Young, H. H. ..... Rochester

*Deceased.
†Affiliate or Associate

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Douglas, Grant, Otter Tail and Wilkin Counties
Regular meetings, Second Wednesday every other month
Annual meeting, December
Number of Members: 58

President
Naegeli, Frank.....Fergus Falls

Secretary
Boysen, J. E.....Pelican Rapids

Arndt, H. W.....Detroit Lakes
Baker, A. C.....Fergus Falls
Baker, N. H.....Fergus Falls
Bergquist, K. E.....Battle Lake
Blakey, A. R.....Osakis
Boline, C. A.....Battle Lake
Boyd, L. M.....Alexandria
Boysen, J. E.....Pelican Rapids
Boysen, Peter.....Pelican Rapids
Broker, W. S.....Wadena
Burnap, W. L.....Fergus Falls
Clifford, G. W.....Alexandria
Combacker, L. C.....Fergus Falls
Drought, W. W.....Fergus Falls
Esser, John.....Perham
Estrem, C. O.....Fergus Falls
Freeman, W. N.....Perham
Griswold, F. E.....Hoffman
Hanson, E. C.....New York Mills
Haskell, A. D.....Alexandria
Heiberg, E. A.....Fergus Falls
Jacobs, G. C.....Fergus Falls
Johnson, O. V.....Fergus Falls
Kierland, P. E.....Alexandria
Lee, W. A.....Fergus Falls
Leibold, H. H. .....Parkers Prairie
Leighton, Robert .....Evansville
Leland, J. T. .....Herman
Lewis, A. J.....Henning
Love, F. A.....Carlos
Lund, C. J. T.....Underwood
McLane, W. O.....Perham
McMahon, L. H.....Breckenridge
Miller, W. A.....New York Mills
Mouritsen, G. J.....Fergus Falls
Naegeli, Frank.....Fergus Falls
Nelson, W. O. B.....Fergus Falls
Parson, L. R.....Elbow Lake
Parson, Lillian B.....Elbow Lake
Patterson, W. L.....Fergus Falls
Paulson, T. S.....Fergus Falls
Paulson, E. C.....Dalton
Randall, A. M.....Ashby
Reeve, E. T.....Elbow Lake
Rimer, E. W.....Breckenridge
Satersmoen, Theodore..Pelican Rapids
Sather, E. R.....Alexandria
Schamber, W. F.....Parkers Prairie
Schleinitz, F. B.....Battle Lake
Serkland, J. C.....Rothsay
Stemsrud, H. L.....Parkers Prairie
Sutton, H. R.....Hoffman
Tanquist, E. J.....Alexandria
Vail, J. B.....San Diego, Calif.
Warner, J. J.....Perham
Wasson, L. F.....Alexandria
Webster, L. J.....Battle Lake
Wray, W. E.....Campbell

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday in every month excepting June, July, August
Annual meeting, last Monday in January
Number of Members: 357

President
Borg, J. F.....St. Paul

Secretary
McCarthy, W. R.....St. Paul

Abbott, J. S.....St. Paul
Adair, A. F., Jr.....St. Paul
Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Alberts, M. W.....St. Paul
Alden, J. F.....St. Paul
Alexander, F. H.....St. Paul
†Armstrong, J. M.....St. Paul
Arnquist, A. S.....St. Paul
Aurelius, J. R.....St. Paul
Ausman, C. F.....St. Paul
Bacon, D. K.....St. Paul
†Bacon, L. C.....St. Paul
Balcome, M. M.....St. Paul
Barry, L. W.....St. Paul
Barsness, Nellie O. N.....St. Paul
*Beadie, W. D.....Cannon Falls
Beals, Hugh.....St. Paul
Beech, R. H.....St. Paul
Beek, H. O.....St. Paul
Bell, C. C.....St. Paul
Benepe, J. L.....St. Paul
Bennion, P. H.....St. Paul
Bentley, N. P.....St. Paul
*Berrisford, P. D.....St. Paul
Bicek, J. F.....St. Paul
Binger, H. E.....St. Paul
Birnberg, T. L.....St. Paul
Bock, R. A.....St. Paul
Boeckmann, Egil.....St. Paul
Bolender, H. L.....St. Paul
Borg, J. F.....St. Paul
Bouma, L. R.....St. Paul
Brand, G. D.....St. Paul
Bray, E. R.....St. Paul
Briggs, J. F.....St. Paul
Broadie, T. E.....St. Paul
Brodie, W. D.....St. Paul
†Brown, E. I.....St. Paul
Brown, J. C.....St. Paul
Bulinski, T. J.....St. Paul
Burch, E. P.....St. Paul
Burch, F. E.....St. Paul
Burns, R. M.....St. Paul
Burton, C. G.....St. Paul
Busher, H. H.....St. Paul
Cain, C. L.....St. Paul
Caldwell, J. P.....St. Paul
Carroll, W. C.....St. Paul
Chadbourn, C. R.....St. Paul
Chatterton, C. C.....St. Paul
Christiansen, A.....St. Paul
†Christison, J. T.....St. Paul
Clark, H. B., Jr.....St. Paul
†Clark, T. C.....Minneapolis
Clarke, E. K.....St. Paul
Cochrane, B. B.....St. Paul
Coddon, W. D.....Wichita, Kan.
Colby, W. L.....St. Paul
Cole, W. H.....St. Paul
Collie, H. G.....St. Paul
Colvin, A. R.....St. Paul
Connor, C. E.....St. Paul
Cook, C. K.....St. Paul
Cooper, C. C.....St. Paul
Countryman, R. S.....St. Paul
Cowern, E. W.....North St. Paul
Critchfield, L. R.....St. Paul
Culligan, J. M.....St. Paul
Dack, L. G.....St. Paul
†Daugherty, E. B., Marine-on-St. Croix
Daugherty, L. E.....St. Paul
†Davis, Herbert.....St. Paul
†Davis, William.....St. Paul
DeCourcey, D. M.....St. Paul
Dedolph, Karl.....St. Paul
Delavan, P. A.....St. Paul
Derauf, B. I.....St. Paul
Dickson, T. H.....St. Paul
Dittman, G. C.....St. Paul
Donohue, P. F.....St. Paul
Dovre, C. M.....St. Paul
Drake, C. B.....St. Paul
Dunn, J. N.....St. Paul
Earl, George.....St. Paul
Earl, John.....St. Paul
Earl, Robert.....St. Paul
Edlund, G.....St. Paul
Edwards, J. W.....St. Paul
Edwards, T. J.....St. Paul
Ely, O. S.....South St. Paul
Emerson, E. C.....St. Paul
Endress, E. K.....St. Paul
Ernest, G. C. H.....South St. Paul
†Eshelby, E. C.....St. Paul
Fahey, E. W.....St. Paul
Ferguson, J. C.....St. Paul
Fesler, H. H.....St. Paul
Flanagan, H. F.....St. Paul
Fogarty, C. W.....St. Paul
Fogelberg, E. J.....St. Paul
Foley, F. E. B.....St. Paul
Freeman, C. D.....St. Paul
Freidman, L. L.....St. Paul
Fritz, W. L.....St. Paul
Froats, C. W.....St. Paul
Gager, E. C.....St. Paul
Garbrecht, Arthur.....St. Paul
Gardiner, D. G.....St. Paul
Geer, E. K.....St. Paul
Gehlen, J. N.....St. Paul
Geist, G. A.....St. Paul
Ghent, C. H.....St. Paul
Gibbs, E. C.....St. Paul
†Gilfillan, J. S.....St. Paul
Gilkey, S. E.....St. Paul
Ginsberg, Wm.....St. Paul
Goltz, E. V.....St. Paul
Grant, H. W.....St. Paul
Gratzek, Thomas.....St. Paul
Grau, R. K.....St. Paul
Gruenhagen, A. P.....St. Paul
Hagaman, G. K.....St. Paul
Hall, A. R.....St. Paul
Hall, H. H.....St. Paul
Hammes, E. M.....St. Paul
Hammond, J. F.....St. Paul
Hanson, H. B.....St. Paul
Harmon, G. E.....St. Paul
Hartfiel, W. F.....St. Paul
Hartley, E. C.....St. Paul
Hassett, M. F.....St. Paul
Hauser, V. P.....St. Paul
*Hawkins, V. J.....St. Paul
†Heath, A. C.....Stillwater
Heck, W. W.....St. Paul
Hedenstrom, F. G.....St. Paul
Hengstler, W. H.....St. Paul
Hensel, C. N.....St. Paul
Herman, Samuel.....St. Paul
Heron, R. C.....St. Paul
Herrmann, E. T.....St. Paul
Hertz, M. J.....St. Paul
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
Hilger, J. A.....St. Paul
Hilger, L. A.....St. Paul
Hilleboe, H. E.....St. Paul
Hiniker, L. P.....St. Paul
Hochfilzer, J. J.....St. Paul
Hoff, Alfred.....St. Paul
Hoffman, M. H.....St. Paul
Holcomb, J. T., Marine-on-St. Croix
Holcomb, O. W.....St. Paul
Holmen, R. W.....St. Paul
Holt, J. E.....St. Paul
Hopkins, G. W.....St. Paul
Howard, M. A.....St. Paul
Howard, W. S.....St. Paul
Hullsiek, H. E.....St. Paul
Hullsiek, R. B.....St. Paul
Ide, A. W.....St. Paul
Ide, L. W.....St. Paul
Ikeda, Kano.....St. Paul
Ingerson, C. A.....St. Paul
Ittner, G. W., Jr.....St. Paul
Jesion, J. W.....St. Paul
Johanson, W. G.....St. Paul
Johnson, A. M.....St. Paul
Johnson, C. E.....St. Paul
Johnson, J. A.....St. Paul
†Johnson, T. H...San Francisco, Calif.
Jones, E. M.....St. Paul
Kamman, G. R.....St. Paul
Kannary, E. L.....St. Paul
Kaplan, D. H.....St. Paul
Karon, I. M.....St. Paul
Kasper, E. M.....St. Paul
Keefe, Rolland.....St. Paul
Kelly, J. V.....St. Paul
Kelly, P. H.....St. Paul
Kenefick, E. V.....St. Paul
Kennedy, W. A.....St. Paul
Kenyon, T. J.....St. Paul
Kesting, Herman.....St. Paul
King, G. L.....St. Paul
Klein, H. N.....St. Paul
Knauff, M. K.....St. Paul
Koepsell, A. A. H.....St. Paul
Kugler, A. A.....St. Paul
Kvitrud, Gilbert.....St. Paul
Langenderfer, F. V.....St. Paul
Larsen, C. L.....St. Paul
Lauer, D. J.....St. Paul
Lax, M. H.....St. Paul
Leahy, Bartholomew.....St. Paul
Leavenworth, R. O.....St. Paul
Leick, R. M.....St. Paul
Leitch, Archibald.....St. Paul

*Deceased.
†Affiliate or Associate

Lepak, J. A.....St. Paul
†Lerche, William .....Cable, Wis.
Leven, N. L.....St. Paul
Levin, Bert.....St. Paul
Levitt, G. X.....St. Paul
Lick, C. L.....St. Paul
Lightbourn, E. L.....St. Paul
Lippman, H. S.....St. Paul
Little, W. J.....St. Paul
Loken, S. M.....St. Paul
Lowe, E. R.....South St. Paul
Lowe, T. A.....South St. Paul
Lundholm, A. M.....St. Paul
Lynch, F. W.....St. Paul
Madden, J. F.....St. Paul
†Markoe, J. C.....St. Paul
Marks, R. W.....St. Paul
Martineau, J. L.....St. Paul
Mattson, C. H.....St. Paul
McCain, D. L.....St. Paul
McCarthy, J. J.....St. Paul
McCarthy, W. R.....St. Paul
McClanahan, J. H.....White Bear
McClanahan, T. S.....White Bear
McEwan, Alexander.....St. Paul
†McLaren, Jennette M.....Minneapolis
McNevin, C. F.....St. Paul
Meade, J. R.....St. Paul
Mears, B. J.....St. Paul
Medelman, J. P.....St. Paul
Meyerding, E. A.....St. Paul
Moga, J. A.....St. Paul
Molander, H. A.....St. Paul
Moquin, Marie A.....St. Paul
Moren, L. A.....St. Paul
Moriarty, Berenice.....St. Paul
†Morrissey, F. B.....St. Paul
Moss, M. N.....St. Paul
Muller, R. T.....St. Paul
Myers, Thomas.....St. Paul
Naegeli, A. E.....St. Paul
Naslund, A. W.....Minneapolis
Nelson, K. L.....Anoka
Nelson, L. A.....St. Paul
Nichols, A. E.....St. Paul
Noble, J. F.....St. Paul
Noble, J. L.....St. Paul
Nuebel, C. J.....St. Paul
Nye, Katherine A.....St. Paul
Nye, Lillian L.....St. Paul
O'Connor, L. J.....St. Paul
Oerting, Harry.....St. Paul
Ogden, Warner.....St. Paul
Ohage, Justus, Jr.....St. Paul
Olson, C. A.....St. Paul
O'Reilley, B. E.....St. Paul
Ostergren, E. W.....St. Paul
Ostergren, Eva-Jane .....St. Paul
Ouelette, A. J.....St. Paul
*Page, C. V.....St. Paul
Pearson, F. R.....St. Paul
Pearson, M. M.....St. Paul
Pederson, A. H.....St. Paul
Perry, C. G.....St. Paul
Peterson, D. B.....St. Paul
Peterson, H. O.....St. Paul
Peterson, J. L. E.....St. Paul
Peterson, V. N.....St. Paul
Plondke, F. J.....St. Paul
Prendergast, H. J.....St. Paul
Radabaugh, R. C.....Hastings
†Ramsey, W. R.....St. Paul
Rea, C. E.....St. Paul
Richards, E. T. F.....St. Paul
Richardson, H. E.....St. Paul
Rick, P. F. W.....St. Paul
Ritchie, H. P.....St. Paul
Ritchie, W. P.....St. Paul
Ritt, A. E.....St. Paul
Rogers, S. F.....St. Paul
Rosenbladt, Louis.....St. Paul
Rosenholtz, Burton.....St. Paul
Rosenthal, Robert.....St. Paul
†Rothrock, J. L.....St. Paul
Rothschild, H. J.....St. Paul
Roy, P. C.....St. Paul
Ruhberg, G. N.....St. Paul
Rutherford, W. C.....St. Paul
Ryan, J. J.....St. Paul
Ryan, J. M.....St. Paul
Ryan, M. E.....St. Paul
Sarnecki, M. M.....St. Paul
Satterlund, V. L.....St. Paul
Savage, F. J.....St. Paul
Schoch, R. B. J.....St. Paul
Schons, Edward.....St. Paul
Schuldt, F. C.....St. Paul
Schulze, A. G.....St. Paul
Schwyzer, Arnold.....St. Paul
Scott, E. E.....St. Paul
†Senkler, G. E.....St. Paul
Setzer, H. J.....St. Paul
Shellman, J. L.....St. Paul
Shillington, M. A.....Glendive, Mont.
Shimonek, S. W.....St. Paul
Short, Jacob.....St. Paul
Simons, L. T.....St. Paul
Singer, B. J.....St. Paul
Skinner, H. O.....St. Paul
Smisek, E. A.....St. Paul
Smith, V. D. E.....St. Paul
Snyder, G. W.....St. Paul
Sohlberg, O. I.....St. Paul
Souster, B. B.....St. Paul
Sprafka, J. M.....St. Paul
Steinberg, C. L.....St. Paul
Sterner, E. G.....St. Paul
Sterner, E. R.....St. Paul
Sterner, O. W.....St. Paul
Stewart, Alexander.....St. Paul
Stinnette, S. E.....St. Paul
Stolpestad, A. H.....St. Paul
Stolpestad, H. L.....St. Paul
Strate, G. E.....St. Paul
Strauss, M. L.....St. Paul
Swanson, J. A.....St. Paul
Swendson, J. J.....St. Paul
Teisberg, C. B.....St. Paul
Thompson, F. A.....St. Paul
Thoreson, M. O.....South St. Paul
Tifft, C. R.....St. Paul
Tregilgas, H. R.....South St. Paul
*Van Slyke, C. A.....St. Paul
Veirs, Dean.....St. Paul
Veirs, Ruby S.....St. Paul
Venables, A. E.....St. Paul
Von der Weyer, William.....St. Paul
Waas, C. W.....St. Paul
Walker, A. E.....St. Paul
Walter, C. W.....St. Paul
Warnock, R. W.....St. Paul
Warren, C. A.....St. Paul
*Warren, E. L.....St. Paul
Watz, C. E.....St. Paul
Webber, F. L.....St. Paul
Weis, B. A.....St. Paul
Weisberg, Maurice .....St. Paul
Welch, M. C.....St. Paul
Wenzel, G. P.....St. Paul
Werner, O. S.....Cambridge
Wheeler, M. W.....St. Paul
Whitacre, J. C.....St. Paul
Whitmore, F. W.....St. Paul
Williams, C. K.....St. Paul
Williamson, G. A.....St. Paul
Wilson, J. A.....St. Paul
Wilson, J. V.....St. Paul
Winnick, J. B.....St. Paul
Wold, K. C.....St. Paul
Wolff, H. J.....St. Paul
Wolkoff, H. J.....St. Paul
Youngren, E. R.....St. Paul
Zachman, L. L.....St. Paul
Zimmermann, H. B.....St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Mahnomen, Marshall, Norman, Pennington, Polk, Red Lake and Roseau Counties
Annual meeting, December
Number of Members: 56

President
Paradis, W. G.....Crookston
Secretary
Oppegaard, C. L.....Crookston

Adkins, C. M.....Thief River Falls
Anderson, W. S.....Minneapolis
Behr, O. K.....Crookston
Berge, D. O.....Roseau
Berlin, A. S.....Hallock
Bertelson, O. L.....Crookston
Biedermann, Jacob..Thief River Falls
Blegen, H. M.....Warren
Boardman, D. V.....Twin Valley
Bohl, G. W.....Ada
Bratrud, Edward....Thief River Falls
Brink, A. A.....Baudette
Brown, L. L.....Crookston
Delmore, J. L., Jr.....Roseau
Delmore, J. L., Sr.....Roseau
Ederer, J. J.....Mahnomen
Erickson, Eskil.....Halstad
Griffin, P. J.....Fertile
Haugseth, Enoch.....Twin Valley
Hedemark, H. H.....Thief River Falls
Helseth, H. K.....Thief River Falls
Henney, W. H.....McIntosh
Hollands, W. H.....Fisher
Holmstrom, C. H.....Warren
Johnson, H. C.....Thief River Falls
Kirk, G. P.....East Grand Forks
Knutson, G. A.....Greenbush
Kostick, W. R.....Fertile
Leitch, N. M.....Warroad
Loken, Theodore.....Ada
Lynde, O. G.....Thief River Falls
Mellby, O. F.....Thief River Falls
Mercil, W. F.....Crookston
Morley, G. A.....Crookston
Nelson, H. E.....Crookston
Norman, J. F.....Crookston
Ohnstad, J. L.....McIntosh
Oppegaard, C. L.....Crookston
Oppegaard, M. O.....Crookston
Paradis, W. G.....Crookston
Parsons, J. G.....Crookston
Reff, A. R.....Crookston
Rice, H. R.....Roseau
*Roy, J. A.....Red Lake Falls
Sather, Allen .....Fosston
Sather, G. A.....Fosston
Sather, R. N.....McIntosh
Sather, R. O.....Crookston
Shaleen, A. W.....Hallock
Shedlov, Abraham.....Fosston
Stevens, John.....Gonvick
Stocking, F. F.....Hallock
Stuurmanns, S. H.....Erskine
Teisberg, J. E.....Middle River
Torgerson, W. B.....Oklee
Uhley, C. G.....Crookston
Wiltrout, I. G.....Oslo

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, Quarterly
Annual meeting, May
Number of Members: 32

President
Mortensbach, H. E.....Hanska
Secretary
Fesenmaier, O. B.....New Ulm

*Deceased.
†Affiliate or Associate

Abbott, C. B.....Springfield
Anderson, E. M.....Lamberton
Benton, P. C.....Gibbon
*Brey, F. W.....Wabasso
Cairns, R. J.....Sanborn
Dubbe, F. H.....New Ulm
Dysterheft, A. F.....Gaylord
Eaves, G. B.....Wabasso
Esser, O. J.....Gibbon
Fesenmaier, O. B.....New Ulm
Fritsche, Albert.....New Ulm
Fritsche, C. J.....New Ulm
Fritsche, T. R.....New Ulm
Gibbons, F. C.....Comfrey
Goblirsch, A. P.....Sleepy Eye

Hammermeister, T. F.....New Ulm
Hovde, Rolf.....Winthrop
Just, H. J.....Lafayette
Kusske, A. L.....New Ulm
Mortensbak, H. E.....Hanska
Nuessle, W. G.....Springfield
Pelant, F. J.....New Ulm
Peterson, R. A.....Vesta
Reineke, G. F.....New Ulm
Saffert, C. A.....New Ulm
Schroeppel, J. E.....Winthrop
Seifert, O. J.....New Ulm
Shima, G. J.....Sleepy Eye
Vogel, H. A. L.....New Ulm
Vogel, J. H.....New Ulm
Wahlberg, E. W.....Sleepy Eye
Weiser, G. B.....New Ulm
Wohlrabe, E. J.....Springfield

RENVILLE COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of each month
Annual meeting, November
Number of Members: 21

President
Penhall, F. W.....Morton
Secretary
Billings, R. E.....Franklin

Adams, R. C.....Bird Island
Billings, R. E.....Franklin
Brand, W. A.....Redwood Falls
Bushard, W. J.....Bird Island
Cole, H. B.....Redwood Falls
Cole, J. G.....Redwood Falls
Cosgriff, J. A.....Olivia
Dordal, J.....Sacred Heart
Erickson, R. E.....Hector
Fawcett, A. M.....Renville
Flinn, T. E.....Redwood Falls
Gaines, E. C.....Buffalo Lake
Hartmann, C. M.....Fairfax
Johnson, O. H.....Redwood Falls
Johnson, W. E.....Morgan
Lenz, J. R.....Morton
Mesker, G. H.....Olivia
Passer, A. A.....Olivia
Penhall, F. W.....Morton
Potthoff, C. J.....Minneapolis
Preisinger, J. W.....Renville

RICE COUNTY MEDICAL SOCIETY

Regular meetings, at call
Annual meeting, at call
Number of Members: 32

President
Lufkin, C. D.....Northfield
Secretary
Weaver, P. H.....Faribault

Beede, Ethel R.....Faribault
Dugan, L. F.....Faribault
Dungay, N. S.....Northfield
Engberg, E. J.....Faribault
Francis, D. W.....Morristown
Haessly, S. B.....Faribault
Hanson, A. M.....Faribault
Huxley, F. R.....Faribault
Kanne, C. W.....Faribault
Lende, Norman.....Faribault
Lexa, F. J.....Lonsdale
Lufkin, C. D.....Northfield
Lyght, C. E.....Northfield
McKeon, J. O.....Montgomery
Mears, R. F.....Northfield
Meyer, F. C.....Kenyon
Meyer, P. F.....Faribault
Moses, Joseph, Jr.....Northfield
Moyer, R. E.....Faribault
Nielsen, A. M.....Northfield
Nuetzman, A. W.....Faribault
*Plonske, C. J.....Faribault
Robilliard, C. M.....Faribault
Rohrer, C. A.....Waterville
Rumpf, C. W.....Faribault
†Rumpf, W. H.....Faribault
Stevenson, F. W.....Faribault
Traeger, C. A.....Faribault
Warren, F. S.....Washington, D. C.
Weaver, P. H.....Faribault
West, E. J.....Faribault
Wilkowske, R. J.....Owatonna
Wilson, Warren.....Northfield
*Wylie, A. R. T.....Faribault

ST. LOUIS COUNTY MEDICAL SOCIETY

Carlton, Cook, Itasca, Lake and St. Louis Counties
Regular meetings, second Thursday every month except July and August
Annual meeting, December
Number of Members: 230

President
Swenson, A. O.....Duluth
Secretary
Buckley, R. P.....Duluth

Abraham, A. L.....Duluth
Adams, B. S.....Hibbing
Addy, E. R.....Gilbert
Ahl, C. W.....Hibbing
Akins, W. M.....Eveleth
Anderson, H. R.....Deer River
Anderson, C. L.....Duluth
Arko, J. L.....Chisholm
Armstrong, E. L.....Duluth
Athens, A. G.....Duluth
Ayres, G. T.....Ely
Bagley, C. M.....Duluth
Bagley, Elizabeth C.....Duluth
Bagley, W. R.....Duluth
Bakkila, Henry.....Duluth
Bardon, Richard.....Duluth
Barney, L. A.....Duluth
Barrett, E. E.....Duluth
Becker, F. T.....Duluth
Bender, J. H.....Big Fork
Bepko, Marie K.....Cloquet
Berdez, G. L.....Duluth
Bianco, A. J.....Duluth
Binet, H. E.....Grand Rapids
*Blacklock, S. S.....Hibbing
Blakely, C. C.....Barnum
Boman, P. G.....Duluth
Bowen, R. L.....Hibbing
Boyer, S. H., Jr.....Duluth
Boyer, S. H., Sr.....Duluth
Braverman, N. J.....Duluth
Bray, P. N.....Duluth
Bray, R. B.....Biwabik
Buckley, R. P.....Duluth
Butler, J. K.....Carlton
Cantwell, W. F.....International Falls
Carstens, C. F.....Hibbing
Chapman, T. L.....Duluth
†Cheney, E. L.....Duluth
Chermak, F. G.....International Falls
Chesley, Ward B.....Virginia
Christensen, E. P.....Two Harbors
Clapp, Stewart .....Duluth
Clark, F. F.....Duluth
Clement, T. G.....Duluth
Collins, A. N.....Duluth
†Collins, H. C.....Duluth
Coventry, W. A.....Duluth
Coventry, W. D.....Duluth
Cunningham, C. B.....Virginia
Dahlin, I. T.....Aurora
Davies, R. J.....Nopeming
Doolittle, L. E.....Duluth
Doyle, G. C.....Duluth
Eckman, P. F.....Duluth
Eckman, R. J.....Duluth
Ekblad, J. W.....Duluth
Elias, F. J.....Duluth
Elliott, W. S.....Virginia
Emanuel, K. W.....Duluth
Eppard, R. M.....Cloquet
Erskine, G. M.....Grand Rapids
Estrem, T. A.....Hibbing
Ewens, H. B.....Virginia
Fankboner, A. V.....Buhl
Fawcett, K. R.....Duluth
Fellows, M. F.....Duluth
Feuling, J. C.....Bovey
Fischer, M. McC.....Duluth
Fiskett, Henry.....Duluth
Forbes, R. S.....Duluth
Gendron, J. F.....Grand Rapids
Gillespie, M. G.....Duluth
Gillespie, N. H.....Duluth
Goldish, D. R.....Duluth
Goodman, C. E.....Virginia
Gorman, W. A., San Francisco, Calif.
Gowan, L. R.....Duluth
†Graham, Robert.....Duluth
Grahek, J. P.....Ely
Graves, W. N.....Duluth
Haney, C. L.....Duluth
Hanson, E. O.....Cloquet
Harlowe, H. D.....Virginia
Harris, C. N.....Hibbing
Hatch, W. E.....Duluth
Hathaway, S. J.....Proctor
Hayes, M. F.....Nashwauk
Hedberg, G. A.....Nopeming
Heiam, W. C.....Cook
Hilding, A. C.....Duluth
Hill, F. E.....Duluth
Hirschboeck, F. J.....Duluth
†Hirschfield, M. S.....Duluth
Hoff, H. O.....Duluth
Hursh, M. M.....Hibbing
Hutchinson, Henry.....Moose Lake
Jacobson, Clarence.....Chisholm
Jensen, T. J.....Duluth
Johnson, K. E.....Duluth
Jolin, F. M.....Bovey
Jolin, R. V.....Grand Rapids
Kelly, A. C.....Duluth
Kemp, M. W.....Moose Lake
Kiesling, I. H.....Coleraine
Klein, Harry.....Duluth
Knapp, F. N.....Duluth
Kohlbry, C. O.....Duluth
Kotchevar, F. R.....Eveleth
Kozberg, Oscar.....Moose Lake
Kraft, Peter.....Duluth
Kuth, J. R.....Duluth
La Bree, R. H.....Chisholm
Laird, A. T.....Nopeming
Lenont, C. B.....Virginia
Lepak, F. J.....Duluth
Litman, S. N.....Duluth
Loofbourrow, E. H.....Keewatin
Macfarlane, P. H.....Chisholm
MacRae, G. C.....Duluth
Magney, F. H.....Duluth
Malmstrom, J. A.....Virginia
Manley, J. R.....Duluth
†Marcley, W. J.....Minneapolis
Martin, W. C.....Duluth
Mayne, R. M.....Duluth
McCarty, P. D.....Ely
†McComb, C. F.....Duluth
†McCoy, Mary K.....Duluth
McDaniel, S. P.....Virginia
McDonald, A. L.....Duluth
McHaffie, O. L.....Duluth
McKenna, M. J.....Grand Rapids

*Deceased.
†Affiliate or Associate

McLeod, J. L.....Grand Rapids
McNutt, J. R.....Duluth
Mead, C. H.....Duluth
Merriman, L. L.....Duluth
Meyer, J. O.....Grand Rapids
Minty, Earl W.....Duluth
Moe, R. J.....Duluth
Moe, Thomas.....Moose Lake
Mollers, T. P.....Mountain Iron
Monroe, P. B.....Two Harbors
Monserud, N. O.....Cloquet
More, C. W.....Eveleth
Morsman, L. W.....Hibbing
Mueller, R. F.....Two Harbors
Mueller, Selma C.....Duluth
Neff, W. S.....Virginia
Nelson, E. H.....Chisholm
Nelson, R. L.....Duluth
Nicholson, M. A.....Duluth
Nutting, R. E.....Duluth
Olson, A. E.....Duluth
Olson, A. O.....Duluth
Palmer, H. A.....Black Duck
Parker, O. W.....Ely
Parker, W. H.....Chisholm
Parson, E. I.....Askov
Pasek, A. W.....Cloquet
Patch, O. B.....Duluth
Pearsall, R. P.....Virginia
Pedersen, R. C.....Duluth
Pennie, D. F.....Duluth
Peterson, E. N.....Virginia
Peterson, J. H.....Duluth
Pfuetze, K. H.....Cannon Falls
Plowman, E. T.....Marble
Power, J. E.....Duluth
Puumala, R. H.....Cloquet
Raadquist, C. S.....Hibbing
Raiter, F. W. S.....Cloquet
Raiter, R. F.....Cloquet
†Robinson, J. M.....Corning, N. Y.
Rokala, H. E.....Biwabik
Rood, D. C.....Duluth
Rosenfield, A. B.....Hibbing
Rowe, O. W.....Duluth
Rowles, E. K.....Coleraine
Rudie, P. S.....Duluth
Ryan, W. J.....Duluth
Sach-Rowitz, Alvan.....Moose Lake
Salter, R. A.....Virginia
Sarff, O. E.....Virginia
Sax, S. G.....Duluth
Scherer, C. A.....Duluth
Schroder, C. H.....Duluth
Schweiger, T. R.....Hibbing
Seashore, R. T.....Duluth
Shapiro, E. Z.....Duluth
Shastid, T. H.....Duluth
Shaw, A. W.....Virginia
Siegel, J. S.....Virginia
Sinamark, Andrew.....Hibbing
Sisler, C. E.....Grand Rapids
*Slyfield, F. F.....Duluth
Smith, C. M.....Duluth
Smith, S. J.....Eveleth
Smith, W. R.....Grand Marais
Snyker, O. E.....Ely
Spang, A. J.....Duluth
Spang, J. S.....Duluth
Spurbeck, R. G.....Cloquet
Strathern, M. L.....Gilbert
Stewart, D. E.....Grand Rapids
Strobel, W. G.....Duluth
Stuart, A. B.....Cloquet
*Sukeforth, L. A.....Duluth
Sutherland, H. N.....Ely
Swanson, P. E.....Virginia
Swedberg, W. A.....Duluth
Swenson, A. O.....Duluth
Taylor, C. W.....Duluth
Terrell, B. J.....Nopeming
Tibbetts, M. H.....Duluth
Tilderquist, D. L.....Duluth
Tingdale, Carlyle.....Hibbing
Trytten, E. G.....Middle River
Tuohy, E. L.....Duluth
Urberg, S. E.....Duluth
Van Valkenberg, J. D.....Floodwood
Vercellini, C. E.....Duluth
†Walker, A. E.....Duluth
Wallace, M. O.....Duluth
Watson, C. G.....Soudan
Webber, E. E.....Duluth
Wells, A. H.....Duluth
Welton, P. C.....Richfield, Utah
Wheeler, D. W.....Duluth
Winter, J. A.....Duluth
Young, T. O.....Duluth
*Young, V. A.....Duluth
Zeman, E. W.....Hibbing
Zlatovski, M. L.....Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of the month
Annual meeting, June
Number of Members: 32

President
Juergens, H. M.....Belle Plaine

Secretary
Pearson, B. F.....Shakopee

Bodaski, A. A.....Montgomery
Buck, F. H.....Shakopee
Cervenka, C. F.....New Prague
Crow, E. R.....Arlington
Eklund, E. J.....Norwood
Emmerson, W. S.....Mayer
Havel, H. W.....Jordan
Hebeisen, M. B.....Chaska
Henriksen, H. G.....Northfield
Juergens, H. M.....Belle Plaine
Klein, J. C.....Shakopee
Kortsch, F. P.....Prior Lake
Kucera, L. J.....Lonsdale
Kucera, S. T.....Lonsdale
Maertz, W. F.....New Prague
Malerich, J. A.....Shakopee
Martin, T. P.....Arlington
Nagel, H. D.....Waconia
Novak, E. E.....New Prague
Olson, C. J.....Belle Plaine
Ormond, D. T.....Waconia
Pearson, B. F.....Shakopee
Phillips, W. H.....Jordan
Pogue, R. E.....Watertown
†Reiter, H. W.....Shakopee
Schimelpfenig, G. T.....Chaska
†Shrader, J. S.....Springfield
Simons, B. H.....Chaska
†Westerman, A. E.....Montgomery
Westerman, F. C.....Montgomery
Wiechman, F. H.....Montgomery
Wunder, H. E.....Shakopee

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Cottonwood, Jackson, Murray, Nobles, Pipestone and Rock Counties

Regular meeting, April
Annual meeting, October
Number of Members: 64

President
Benjamin, W. G.....Pipestone

Secretary
Mork, B. O., Jr.....Worthington

Anderson, O. W.....Luverne
Arnold, E. W.....Adrian
Balmer, A. I.....Pipestone
Basinger, H. P.....Windom
Basinger, H. R.....Mountain Lake
Beckering, Gerrit.....Edgerton
Benjamin, W. G.....Pipestone
Bofenkamp, F. W.....Luverne
Bong, J. H.....Jasper
Brown, A. H.....Pipestone
Carlson, J. V.....Westbrook
Chadbourn, A. G.....Heron Lake
Chunn, S. S.....Pipestone
*Clark, H. H.....Minneapolis
Cress, P. J.....Ellsworth
DeBoer, Hermanus.....Edgerton
Doman, V. W.....Lakefield
Doms, H. C. A.....Slayton
Engh, Sigfred.....Jackson
Halloran, W. H.....Jackson
Halpern, D. J.....Brewster
Harrison, P. W.....Worthington
Hebbel, Robert.....Windom
Hitchings, W. S.....Lakefield
Hoyer, L. J.....Windom
Johnson, R. E.....Worthington
Johnston, L. F.....Slayton
Kilbride, E. A.....Worthington
Kilbride, J. S.....Worthington
Larson, J. T.....Lake Wilson
Lohmann, J. G.....Jasper
Maitland, D. P.....Jackson
Maitland, E. T.....Jackson
†Manson, F. M.....Worthington
McElmeel, E. F.....Pipestone
McLane, Evelyn G.....Jackson
Mork, B. O., Jr.....Worthington
Mork, B. O., Sr.....Worthington
Nealy, D. E.....Adrian
Pankratz, P. J.....Mountain Lake
Pierson, R. F.....Slayton
Piper, W. A.....Mountain Lake
Rogers, C. W.....Heron Lake
Rose, J. T.....Lakefield
Schade, F. L.....Worthington
Schutz, E. S.....Mountain Lake
Schmidt, W. R.....Worthington
Sether, A. F.....Ruthton
Settlage, A. F. E.....Worthington
Sherman, C. L.....Luverne
Sjostrom, L. E.....Storden
Slater, S. A.....Worthington
Smith, G. G.....Fulda
Sogge, L. L.....Windom
Sorum, F. T.....Jasper
Stanley, C. R.....Worthington
Stevenson, B. M.....Fulda
Stratte, H. C.....Windom
Thorson, E. O.....Luverne
Tofte, Josephine.....Minneapolis
Waller, J. D.....Wilmont
Wells, W. B.....Jackson
Williams, C. A.....Pipestone
Williams, L. A.....Slayton
Wilson, I. H.....Worthington

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, third Thursday of the month
Annual meeting, third Thursday of December
Number of Members: 54

President
Kingsbury, E. M.....Clearwater

Secretary
Libert, J. N.....St. Cloud

Barnett, J. M.....Cold Spring
Baumgartner, F. H.....Albany
Beuning, J. B.....St. Cloud
Brigham, C. F.....St. Cloud
Buscher, J. C.....St. Cloud
Clark, H. B.....St. Cloud
Donaldson, C. S.....Foley
DuBois, J. F.....Sauk Center
Engstrom, G. F.....Belgrade
Evans, L. M.....Sauk Rapids
Fleming, T. N.....St. Cloud
Freeman, W. L.....St. Cloud
Friesleben, William.....Sauk Rapids
Gaida, J. B.....St. Cloud

*Deceased.
†Affiliate or Associate

Goehrs, G. H.....St. Cloud
Goehrs, H. W.....St. Cloud
Haberman, Emil.....Osakis
Halenback, P. L.....St. Cloud
†Hemstead, Werner.....Brainerd
Henry, C. J.....Milaca
*Holdridge, George.....Foley
Johnson, Walfred.....Sauk Center
Jones, R. N.....St. Cloud
Keithahn, E. E.....Kimball
Kern, M. C.....Freeport
*Kern, M. J.....St. Cloud
Kettlewell, R. B.....Sauk Center
Kingsbury, E. M.....Clearwater
Kohler, D. W.....St. Joseph
Koop, S. H.....Richmond
Kuhlmann, August.....Melrose
Lewis, C. B.....St. Cloud
Libert, J. N.....St. Cloud
Mahowald, A.....Albany
McDowell, J. P.....St. Cloud
Meyer, A. A.....Melrose
Moos, D. J.....Minneapolis
Musachio, N. F.....Foley
Myre, C. R.....Paynesville
Prendergast, J. J.....St. Cloud
Raetz, S. J.....Maple Lake
Rathbun, C. A.....St. Cloud
Richards, W. B.....St. Cloud
Rumpf, W. H.....St. Cloud
Sandven, N. O.....Paynesville
Schatz, F. J.....St. Cloud
Sherwood, G. E.....Kimball
Stangl, P. E.....St. Cloud
Stewart, N. E.....Northport, N. Y.
Street, Bernard.....St. Cloud
Sutton, C. S.....St. Cloud
Townsend, De Wayne.....Brooten
Walfred, K. A.....St. Cloud
Watson, W. J.....Holdingford
Wenner, W. T.....St. Cloud
Zachman, A. H.....Melrose

STEELE COUNTY MEDICAL SOCIETY

Regular meetings, Second and Fourth Tuesday of Month
Annual meeting, January
Number of Members: 17

President
Ertel, E. Q.....Ellendale

Secretary
Morehead, D. E.....Owatonna

Berghs, L. V.....Owatonna
Carlson, V. W.....Blooming Prairie
Dewey, D. H.....Owatonna
Ertel, E. Q.....Ellendale
Hartung, E. H.....Claremont
Kreuzer, T. C.....Owatonna
McEnaney, C. T.....Owatonna
McIntyre, J. A.....Owatonna
Melby, Benedik.....Blooming Prairie
Morehead, D. E.....Owatonna
Nelson, E. J.....Owatonna
Roberts, O. W.....Owatonna
Schaefer, J. F.....Owatonna
Senn, E. W.....Owatonna
Stewart, A. B.....Owatonna
Stransky, T. W.....Owatonna
Westra, J. J.....Muncie, Ind.

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Beltrami, Cass, Clearwater, Crow Wing, Hubbard
Koochiching, Lake of the Woods, Morrison, Todd and Wadena Counties
Regular meetings, Spring, Summer, Fall
Annual meeting, January
Number of Members: 94

President
Hawkinson, John P.....Crosby

Secretary
Badeaux, G. I.....Brainerd

Adkins, G. H.....Pine River
Amundson, A. E.....Little Falls
Badeaux, G. I.....Brainerd
Beise, R. A.....Brainerd
Borgerson, A. H.....Long Prairie
Bosland, H. G.....Verndale
Bray, K. E.....Park Rapids
Burns, H. A.....Ah-Gwah-Ching
Cardle, G. E.....Brainerd
Carlson, C. E.....Aitkin
†Christie, G. R.....Long Prairie
Christie, R. L.....Long Prairie
Cook, J. M.....Staples
Coombs, C. H.....Cass Lake
†Corrigan, J. E.....Waycross, Ga.
Craig, C. C.....International Falls
Davis, L. F.....Wadena
Davis, L. T.....Wadena
Davis, R. D.....Clearbrook
Davis, T. C.....Wadena
East, John.....Northome
Eiler, John.....Park Rapids
Eyres, T. E. .....Pequot
Fait, R. V.....Little Falls
Fitzsimons, W. E.....Brainerd
Frost, H. T.....Wadena
Garlock, A. V.....Bemidji
Garlock, D. H.....Bemidji
Gerber, M. P.....Brainerd
Ghostley, Mary C.....Puposky
Gifford, B. L.....Long Prairie
†Gilmore, Rowland.....Bemidji
Grogan, J. S.....Wadena
Groschupf, T. P.....Bemidji
Grose, F. N.....Clarissa
Halliday, G. J.....Brainerd
Haller, William.....Bemidji
Hanover, R. D.....Littlefork
Hawkinson, J. P.....Crosby
Hiebert, H. L.....Ah-Gwah-Ching
Higgs, W. W.....Park Rapids
House, Z. E.....Cass Lake
Houston, D. M.....Park Rapids
Hubbard, O. E.....Brainerd
Hubin, E. G.....Deerwood
Jacobson, D. J.....Bemidji
Jamieson, E. F.....Brainerd
Johnson, D. L.....Little Falls
Johnson, E. W.....Bemidji
Kerlan, Irvin.....Washington, D. C.
Knights, J. A.....Bemidji
Lamb, H. L.....Little Falls
Larson, L. J.....Bagley
Lee, H. W.....Brainerd
Leemhuis, G. H.....McGregor
Lenarz, A. J.....Browerville
Lund, W. J.....Staples
*Marcum, E. H.....Bemidji
Mark, Hilbert.....Minneapolis
Mason, J. A.....Little Rock, Ark.
McCann, D. F.....Bemidji
Mitby, I. L.....Aitkin
Monahan, R. H...International Falls
Mosby, M. E.....Long Prairie
Mulligan, A. M.....Camp Hulen, Tex.
Murray, R. A.....Aitkin
Nelson, N. P.....Brainerd
O'Leary, J. H.....Staples
Petraborg, H. T.....Aitkin
Pierce, C. H.....Wadena
Potek, David.....International Falls
Quanstrom, V. E.....Brainerd
†Ratcliffe, J. J.....Aitkin
Ringle, O. F.....Walker
†Roberts, L. M.....Little Falls
Shannon, S. S.....Ironton
Simons, E. J.....Swanville
Simons, S. J.....Akeley
Smith, B. A.....Crosby
Stafford, C. E.....Baudette
Stein, R. J.....Pierz
Swedenburg, P. A.....Swanville
Thabes, J. A., Jr.....Brainerd
Thabes, J. A., Sr.....Brainerd
Trommald, Gladys, B. K.
Northville, Mich.
Vandersluis, C. W.....Bemidji
Watson, A. M.....Royalton
Watson, P. T.....Cass Lake
Watson, S. W.....Royalton
Whittemore, D. D.....Bemidji
Will, C. B.....Bertha
Will, W. W.....Bertha
Wilson, V. O.....Minneapolis
Wingquist, C. G.....Crosby
Withrow, M. E.....International Falls

WABASHA COUNTY MEDICAL SOCIETY

Regular meetings, March, October
Annual meeting, first Thursday after first Monday in October
Number of Members: 16

President
Mahle, D. G.....Plainview

Secretary
Wilson, W. F.....Lake City

Bayley, E. C.....Lake City
Bouquet, B. J.....Wabasha
Bowers, R. N.....Mazeppa
†Cochrane, W. J.....Lake City
Collins, J. S.....Wabasha
†Dempsey, D. P.....Kellogg
Ellis, E. W.....Elgin
Flesche, B. A.....El Paso, Tex.
Glabe, R. A.....Plainview
Hendrickson, R. R.....Wabasha
Mahle, D. G.....Plainview
Ochsner, C. G.....Wabasha
Replogle, W. H.....Wabasha
†Slocumb, J. A.....Plainview
Wellman, T. G.....Lake City
†Wilson, W. F.....Lake City

WASECA COUNTY MEDICAL SOCIETY

Regular meetings, none
Annual meeting, January
Number of Members: 9

President
Spittler, R. O.....New Richland
Secretary
Olds, G. H.....Waseca

Bernstein, W. C.....Minneapolis
Gallagher, B. J.....Waseca
Hottinger, R. C.....Janesville
McIntire, H. M.....Waseca
Oeljen, S. C. G.....Waseca
Olds, G. H.....Waseca
Spittler, R. O.....New Richland
Swenson, O. J.....Waseca
Wadd, C. T.....Janesville

*Deceased.
†Affiliate or Associate

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday in January, February, March, April, May, September, October November and December
Annual meeting second Tuesday in December
Number of Members: 17

President
Johnson, R. G.....Stillwater

Secretary
Boleyn, E. S.....Stillwater

Boleyn, E. S.....Stillwater
Brooks, G. F.....Stillwater
Gray, R. C.....Minneapolis
Haines, J. H.....Stillwater
Humphrey, W. R.....Stillwater
Johnson, R. G.....Stillwater
Josewski, R. J.....Stillwater
Kalinoff, D.....Stillwater
McCarten, F. M.....Stillwater
Mingo, F. E.....Hugo
Poirier, J. A.....Forest Lake
Ruggles, G. McC.....Forest Lake
Samson, E. R.....Stillwater
Sherman, C. H.....Stillwater
Strand E. V.....Bayport
Stuhr, J. W.....Stillwater
Wilkinson, Stella L.....Newport

WATONWAN COUNTY MEDICAL SOCIETY

Regular meeting, at call
Annual meeting, December
Number of Members: 9

President
Thompson, Albert .....St. James

Secretary
Grimes, H. B.....Madelia

Bergman, O. B.....St. James
Bratrude, E. J.....St. James
Bregel, F. L.....St. James
Coulter, E. B.....Madelia
Grimes, H. B.....Madelia
Hagen, O. E.....Butterfield
Hammar, L. M.....Butterfield
McCarthy, W. J.....Madelia
Thompson, Albert.....St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Pope, Stevens, and Traverse Counties

Regular meetings, second Wednesday, March, May, October, December
Annual meeting October
Number of Members: 28

President
Behmler, F. W.....Morris

Secretary
Linde, Herman.....Cyrus

Arneson, A. I.....Morris
Bates, B. V.....Browns Valley
Behmler, F. W.....Morris
Bergan, Otto.....Clinton
Bolsta, Charles.....Ortonville
Caine, C. E.....Morris
Dahle, M. B.....Glenwood
Doleman, N. F.....Tintah
Eberlin, E. A.....Glenwood
Elsey, E. McC.....Glenwood
Elsey, J. R.....Glenwood
Engdahl, F. W.....Ortonville
Ewing, C. F.....Wheaton
Fitzgerald, E. T.....Morris
Giesen, A. F.....Starbuck
Jarvis, B. W.....Lowry
Karn, B. R.....Ortonville
Lindberg, A. L.....Wheaton
Linde, Herman.....Cyrus
Magnuson, A. E.....Graceville
Merrill, Robert .....Morris
McIver, B. A.....Lowry
Mooney, L. P.....Graceville
Muir, W. F.....Graceville
O'Donnell, D. M.....Ortonville
Oliver, C. I.....Graceville
Oliver, I. L.....Graceville
Ransom, M. L.....Hancock

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in January, April, July, October
Annual meeting, first Monday in January
Number of Members: 29

President
Satterlee, H. W.....Lewiston

Secretary
Tweedy, J. A.....Winona

Benoit, F. T.....Winona
Christensen, E. E.....Winona
Hamlon, J. S.....St. Charles
Heise, Herbert .....Winona
Heise, W. F. C.....Winona
Heise, W. V.....Winona
Keyes, J. D.....Winona
Lindsay, W. V.....Winona
Loomis, G. L.....Winona
Mattison, P. A.....Winona
McLaughlin, E. M.....Winona
Meinert, A. E.....Winona
Neumann, C. A.....Winona
Page, R. L.....St. Charles
Risser, E. D.....Winona
Robbins, C. P.....Winona
Roemer, H. J.....Winona
Roth, F. D.....Lewiston
Satterlee, H. W.....Lewiston
Schaefer, Samuel.....Winona
Steiner, I. W.....Winona
Tweedy, G. J.....Winona
Tweedy, J. A.....Winona
Tweedy, R. B.....Winona
Walker, G. H.....Winona
Whetstone, S. D.....Owatonna
Wilson, R. H.....Winona
Younger, L. I.....Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, first Tuesday in October
Number of Members: 18

President
Hansen, Rorbye.....Monticello

Secretary
Catlin, J. J.....Buffalo

Anderson, W. P.....Buffalo
Bendix, L. H.....Annandale
Catlin, J. J.....Buffalo
Catlin, T. J.....Buffalo
Ellison, F. E.....Monticello
Greenfield, W. T.....Delano
Grundset, O. J.....Montrose
Hansen, Rorbye .....Monticello
Harriman, L.....Howard Lake
Hart, W. E.....Monticello
Lee, J. L.....Watertown
Peterson, O. L.....Cokato
Phillips, A. E.....Delano
Ridgway, A. M.....Annandale
Roholt, C. L.....Waverly
Rolig, D. H.....Howard Lake
Thielen, R. D.....St. Michael
Thompson, Arthur.....Cokato

*Deceased
†Affiliate or Associate

ALPHABETIC ROSTER

Aagaard, G. N., Jr.....Minneapolis
Aanes, A. M.....Red Wing
Aanes, A. R.....Ellsworth, Wis.
Abbott, C. B.....Springfield
Abbott, J. S.....St. Paul
†Aborn, W. H.....Hawley
Abraham, A. L.....Duluth
Abramson, Milton.....Minneapolis
Adair, A. F., Jr.....St. Paul
Adams, B. S.....Hibbing
Adams, R. C.....Bird Island
Adams, R. C.....Rochester
Addy, E. R.....Gilbert
Adkins, C. M.....Thief River Falls
Adkins, G. H.....Pine River
Adson, A. W.....Rochester
Affeldt, D. E.....Kasson
Ahl, C. W.....Hibbing
Ahlfs, J. J.....Caledonia
Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Aita, J. A.....Rochester
Aitkens, H. B.....Le Center
Akins, W. M.....Eveleth
Albers, G. D.....Rochester
Alberts, M. W.....St. Paul
Alden, J. F.....St. Paul
Alexander, F. H.....St. Paul
Alexander, H. A.....Minneapolis
Aling, C. A.....Minneapolis
Aling, C. P.....Minneapolis
*Allen, A. W.....Austin
Allen, C. C.....Austin
Allen, E. V. N.....Rochester
Allen, H. W.....Minneapolis
Allen, H. B.....Austin
Allison, R. G.....Minneapolis
Altnow, H. O.....Minneapolis
Alvarez, W. C.....Rochester
Amberg, Samuel.....Rochester
Amundson, A. E.....Little Falls
Andersen, A. G.....Minneapolis
Andersen, S. C.....Minneapolis
Anderson, B. M.....Rochester
Anderson, C. D.....Rochester
Anderson, C. L.....Duluth
Anderson, D. D.....Minneapolis
Anderson, D. P., Jr.....Austin
Anderson, E. D.....Minneapolis
Anderson, E. M.....Lamberton
Anderson, E. R.....Minneapolis
Anderson, F. J.....Minneapolis
Anderson, H. R.....Deer River
Anderson, J. K.....Minneapolis
Anderson, K. W.....Minneapolis
Anderson, M. J.....Rochester
Anderson, O. W.....Luverne
Anderson, P. A.....Minneapolis
Anderson, R. E.....Willmar
Anderson, S. H.....Red Wing
Anderson, U. S.....Minneapolis
Anderson, W. P.....Buffalo
Anderson, W. S.....Minneapolis
Andreassen, E. C..Camp Claiborne, La.
Andresen, K. D.....Minneapolis
Andrews, R. N.....Mankato
Andrews, R. S.....Minneapolis
Andrus, F. C.....Minneapolis
Annis, H. B.....Minneapolis
Arends, A. L.....Sandstone
Arey, S. L.....Excelsior
Arko, J. L.....Chisholm
Arlander, C. E.....Minneapolis
Arling, L. S.....Minneapolis
Armstrong, E. L.....Duluth
†Armstrong, J. M.....St. Paul
Arndt, H. W.....Detroit Lakes
Arneson, A. I.....Morris
Arnold, Anna W.....Minneapolis
Arnold, D. C.....Minneapolis
Arnold, E. W.....Adrian
Arnquist, A. S.....St. Paul
Arnson, J. M.....Benson
Arvidson, C. G.....Minneapolis
Athens, A. G.....Duluth
Aune, Martin.....Minneapolis
Aurand, W. H.....Minneapolis
Aurelius, J. R.....St. Paul
Ausman, C. F.....St. Paul
Autry, D. H.....Little Rock, Ark.
Ayres, G. T.....Ely
Bacon, D. K.....St. Paul
†Bacon, L. C.....St. Paul
*Bacon, R. S.....Montevideo

*Deceased
†Affiliate or Associate

Badeaux, G. I.....Brainerd
Baggenstoss, A. H.....Rochester
Bagley, C. M.....Duluth
Bagley, Elizabeth C.....Duluth
Bagley, W. R.....Duluth
Bailey, H. B.....Fairmont
Bair, H. L.....Rochester
Baken, M. P.....Minneapolis
Baker, A. B.....Minneapolis
Baker, A. C.....Fergus Falls
Baker, A. T.....Minneapolis
Baker, E. L.....Minneapolis
Baker, G. S.....Rochester
Baker, H. R.....Hayfield
Baker, Looe.....Minneapolis
Baker, N. H.....Fergus Falls
Baker, R. L.....Hayfield
Baker, Theodore, Jr.....Rochester
Bakkila, H. E.....Duluth
Balcome, M. M.....St. Paul
Baldigo, E. M.....Red Wing
Balfour, D. C.....Rochester
Balkin, S. G.....Minneapolis
Balmer, A. I.....Pipestone
†Barber, J. P.....Minneapolis
Bardon, Richard.....Duluth
Bargen, J. A.....Rochester
Barker, N. W.....Rochester
Barnes, A. R.....Rochester
Barnett, J. M.....Cold Spring
Barney, L. A.....Duluth
Barr, L. C.....Albert Lea
Barr, R. N.....St. Paul
Barr, W. H.....Wells
Barrett, E. E.....Duluth
Barrett, R. H.....Rochester
Barron, Moses.....Minneapolis
Barry, L. W.....St. Paul
Barsness, Nellie O. N.....St. Paul
Basinger, H. P.....Windom
Basinger, H. R.....Mountain Lake
Basom, W. C.....Rochester
Bass, G. W.....Minneapolis
Bates, B. V.....Browns Valley
Baumgartner, F. H.....Albany
Baxter, S. H.....Minneapolis
Bayard, H. F.....Minneapolis
Bayley, E. C.....Lake City
*Beadie, W. D.....Cannon Falls
Beals, Hugh.....St. Paul
Beard, A. H.....Minneapolis
Beard, Crowell.....Rochester
Beck, N. R.....Rochester
Becker, F. T.....Duluth
Beckering, Gerrit.....Edgerton
Beckman, W. G.....Minneapolis
Bedford, E. W.....Minneapolis
Beech, R. H.....St. Paul
Beede, Ethel R.....Faribault
Beek, H. O.....St. Paul
Behmler, F. W.....Morris
Behr, O. K.....Crookston
Beise, R. A.....Brainerd
Beizer, L. H.....Rochester
Bell, C. C.....St. Paul
†Bell, E. T.....Minneapolis
Belote, G. B.....Caledonia
Belzer, M. S.....Minneapolis
Bender, J. H.....Big Fork
Bendix, L. H.....Annandale
Benedict, W. L.....Rochester
Benepe, J. L.....St. Paul
Benson, R. E.....Rochester
Benesh, L. A.....Minneapolis
Benesh, N. G.....Minneapolis
Benham, E. W.....Mankato
Benjamin, A. E.....Minneapolis
Benjamin, E. G.....San Antonio, Tex.
Benjamin, H. G.....Ft. Knox, Ky.
Benjamin, W. G.....Pipestone
Benn, F. G.....Minneapolis
Bennion, P. H.....St. Paul
Benoit, F. T.....Winona
Bepko, Marie K.....Cloquet
Bentley, N. P.....St. Paul
Benton, P. C.....Gibbon
Berdez, G. L.....Duluth
Bergan, Otto.....Clinton
Berge, D. O.....Roseau
Bergen, C. T.....Bricelyn
Berger, A. G.....Minneapolis
Bergh, G. S.....Minneapolis
Bergh, L. N.....Montevideo
Berghs, L. V.....Owatonna
Bergman, O. B.....St. James
Bergquist, K. E.....Battle Lake
Berkman, D. M.....Rochester

Berkman, J. M.....Rochester
Berkwitz, N. J.....Minneapolis
Berlin, A. S.....Hallock
Berman, Reuben.....Minneapolis
Bernstein, W. C.....Minneapolis
*Berrisford, P. D.....St. Paul
Bertelson, O. L.....Crookston
Bessesen, A. N., Jr.....Minneapolis
Bessesen, D. H.....Minneapolis
Bessesen, W. A.....Minneapolis
Beuning, J. B.....St. Cloud
Bianco, A. J.....Duluth
Bicek, J. F.....St. Paul
Bickel, W. H.....Rochester
Biedermann, Jacob..Thief River Falls
Bigelow, C. E.....Dodge Center
Billings, R. E.....Franklin
Binet, H. E.....Grand Rapids
Binger, H. E.....St. Paul
Binger, M. W.....Rochester
Birnberg, T. L.....St. Paul
Black, B. M.....Rochester
Black, William.....Mankato
*Blacklock, S. S. .....Hibbing
Blackwell, W. J.....Rochester
Blake, James.....Hopkins
Blake, James A.....Hopkins
Blakely, C. C.....Barnum
Blakey, A. R.....Osakis
Blanchard, H. G.....Fairmont
Blegen, H. M.....Warren
Blomberg, W. R.....Princeton
Blumenthal, J. S....Columbia Heights
Blumstein, Alex .....Minneapolis
Boardman, D. V.....Twin Valley
Bock, R. A.....St. Paul
Bodaski, A. A.....Montgomery
Boeckmann, Egil.....St. Paul
Boehme, E. J.....Minneapolis
Boehrer, J. J.....Minneapolis
Bofenkamp, F. W.....Luverne
Bohl, G. W.....Ada
Boies, L. R.....Minneapolis
Bolender, H. L.....St. Paul
Boleyn, E. S.....Stillwater
Boline, C. A.....Battle Lake
Bolsta, Charles .....Ortonville
Boman, P. G.....Duluth
Bong, J. H.....Jasper
Boody, G. J., Jr.....Dawson
Booth, A .E.....Minneapolis
Boothby, W. M.....Rochester
Boreen, C. A.....Minneapolis
Borg, J. F.....St. Paul
Borgerson, A. H.....Long Prairie
Borgeson, E. J.....Minneapolis
Borman, C. N.....Minneapolis
Bosland, H. G.....Verndale
Bossert, C. S.....Mora
Bossingham, O. N.....Lake Benton
Bottolfson, B. T.....Moorhead
Bouma, L. R.....St. Paul
†Bouman, H. A. H.....Minneapolis
Bouquet, B. J.....Wabasha
Bowen, R. L.....Hibbing
Bowers, R. N.....Mazeppa
Bowing, H. H.....Rochester
Boyd, L. M.....Alexandria
Boyer, S. H.....Duluth
Boyer, S. H., Jr.....Duluth
Boynton, Ruth E.....Minneapolis
Boysen, Herbert.....Welcome
Boysen, J. E.....Pelican Rapids
Boysen, Peter.....Pelican Rapids
Braasch, W. F.....Rochester
Brand, G. D.....St. Paul
Brand, W. A.....Redwood Falls
Branham, D. S.....Albert Lea
Branton, A. F.....Willmar
Branton, B. J.....Willmar
Bratrud, A. F.....Minneapolis
Bratrud, Edward....Thief River Falls
Bratrude, E. J.....St. James
Braverman, N. J.....Duluth
Bray, E. R.....St. Paul
Bray, K. E.....Park Rapids
Bray, P. N.....Duluth
Bray, R. B.....Biwabik
Bregel, F. L.....St. James
Brekke, H. J.....Minneapolis
*Brey, F. W.....Wabasso
Briggs, J. F.....St. Paul
Brigham, C. F.....St. Cloud
Brigham, F. T.....Watkins
Brink, A. A.....Baudette
Brink, D. M.....Isle
Broadie, T. E.....St. Paul

Broders, A. C.....Rochester
Brodie, W. D.....St. Paul
Broker, W. S.....Wadena
Brooks, C. N.....Minneapolis
Brooks, G. F.....Stillwater
Brown, A. E.....Rochester
Brown, A. H.....Pipestone
†Brown, E. D.....Paynesville
†Brown, E. I.....St. Paul
Brown, G. E., Jr.....Pine City
Brown, H. A.....Rochester
Brown, H. O.....Rochester
Brown, J. C.....St. Paul
Brown, J. R.....Rochester
Brown, L. L.....Crookston
Brown, M. H.....Rochester
Brown, P. W.....Rochester
Browne, H. C., Jr.....Rochester
Brownstone, Manuel.....Sandstone
Brunsting, L. A.....Rochester
Brusegard, J. F.....Red Wing
Brutsch, G. C.....Minneapolis
Bryant, F. L.....Minneapolis
Buchstein, H. F.....Minneapolis
Buck, F. H.....Shakopee
Buckley, R. P.....Duluth
Buie, L. A.....Rochester
Bulinski, T. J.....St. Paul
Bulkley, Kenneth.....Minneapolis
Bunker, B. W.....Anoka
Burch, E. P.....St. Paul
Burch, F. E.....St. Paul
Burchell, H. B.....Rochester
Burks, J. W., Jr.....Rochester
Burlingame, D. A.....Minneapolis
Burnap, W. L.....Fergus Falls
Burns, F. M.....Milan
Burns, H. A.....Ah-Gwah-Ching
*Burns, H. D.....Albert Lea
Burns, L. S.....So. St. Paul
Burns, M. A.....Milan
Burns, R. M.....St. Paul
Burton, C. G.....St. Paul
Buscher, J. C.....St. Cloud
Bushard, W. J.....Bird Island
Busher, H. H.....St. Paul
Butler, John.....Minneapolis
Butler, J. K.....Carlton
Butt, H. R.....Rochester
Butturff, C. R.....Freeborn
Butzer, J. A.....Mankato
Buzzelle, L. K.....Minneapolis

Cable, M. L.....Minneapolis
Cabot, V. S.....Minneapolis
Cady, L. H.....Minneapolis
Cain, C. L.....St. Paul
Caine, C. E.....Morris
Cairns, R. J.....Sanborn
Caldwell, J. P.....St. Paul
Calhoun, F. W.....Albert Lea
Callahan, F. F.....Pokegama
Callerstrom, G. W.....Minneapolis
Cameron, Isabell L.....Minneapolis
Camp, J. D.....Rochester
Camp, W. E.....Minneapolis
Campbell, D. C.....Rochester
Campbell, J. R.....Rochester
Campbell, L. M.....Minneapolis
Campbell, O. J.....Minneapolis
Canfield, W. W.....Houston
Cantwell, W. F.....International Falls
Cardle, A. E.....Minneapolis
Cardle, G. E.....Brainerd
Carey, J. B.....Minneapolis
Carlson, C. E.....Aitkin
Carlson, J. V.....Westbrook
Carlson, Lawrence.....Minneapolis
Carlson, L. T.....Minneapolis
Carlson, V. W.....Blooming Prairie
Carman, J. E.....Detroit Lakes
Caron, R. P.....Minneapolis
Carroll. W. C.....St. Paul
Carryer, H. M.....Rochester
Carstens, C. F.....Hibbing
Caspers, C. G.....Washington, D. C.
Catlin, J. J.....Buffalo
Catlin. T. J.....Buffalo
Catinella, P. J.....Rochester
Cavanor, F. T.....Camp Forest, Tenn.
Cervenka, C. F.....New Prague
Chadbourn, A. G.....Heron Lake
Chadbourn, C. R.....St. Paul
Challman, S. A.....Minneapolis
Chambers, W. C.....Blue Earth
Chapman, A. S.....Rochester
Chapman, T. L.....Duluth
Chatterton, C. C.....St. Paul
†Cheney, E. L.....Duluth

Chermak, F. G.....International Falls
Chesley, A. J.....St. Paul
Chesley, Ward B.....Virginia
Christensen, B. H.....Rochester
Christensen, E. E.....Winona
Christensen, E. P.....Two Harbors
Christenson, G. R.....Minneapolis
Christiansen, Andrew.....St. Paul
Christianson, H. W.....Minneapolis
†Christie, G. R.....Long Prairie
Christie, R. L.....Long Prairie
†Christison, J. T.....St. Paul
Chunn, S. S.....Pipestone
Clagett, O. T.....Rochester
Clapp, Stewart.....Duluth
Clark, F. F.....Duluth
Clark, H. B.....St. Cloud
Clark, H. B., Jr.....St. Paul
*Clark, H. H.....Minneapolis
Clark, H. S.....Minneapolis
Clark, L. W.....Spring Valley
†Clark, T. C.....Minneapolis
Clarke, E. K.....St. Paul
Clay, L. B.....Minneapolis
Claydon, D. R.....Red Wing
Claydon, H. F.....Zumbrota
Claydon, L. E.....Red Wing
Clegg, R. S.....Rochester
Clement, J. B.....Lester Prairie
Clement, T. G.....Duluth
Cleveland, W. H.....Rochester
Clifford, G. W.....Alexandria
Clifton, T. A.....Chatfield
Clothier, E. F.....Elk River
Cochrane, B. B. .....St. Paul
Cochrane, R. F.....Minneapolis
†Cochrane, W. J.....Lake City
Coddon, W. D.....Little Rock, Ark.
Cohen, B. A.....Minneapolis
Cohen, S. S.....Oak Terrace
Colby, W. L.....St. Paul
Cole, H. B.....Redwood Falls
Cole, J. G.....Redwood Falls
Cole, W. H.....St. Paul
Collie, H. G.....St. Paul
Collins, A. N.....Duluth
†Collins, H. C.....Duluth
Collins, J. S.....Wabasha
Colp, E. A.....Robbinsdale
Colvin, A. R.....St. Paul
Coulter, E. B.....Madelia
Combacker, L. C.....Fergus Falls
Comfort, M. W.....Rochester
Condit, W. H.....Minneapolis
Condon, W. B.....Rochester
Conner, H. M.....Rochester
Connor, C. E.....St. Paul
Cook, C. K.....St. Paul
Cook, E. N.....Rochester
*Cook, H. W.....Minneapolis
Cook, J. M.....Staples
Coombs, C. H.....Cass Lake
Cooney, H. C.....Princeton
Cooper, C. C.....St. Paul
Cooper, M. D.....Winnebago
Cooperman, H. O.....Minneapolis
Corbett, J. F. .....Minneapolis
Corniea, A. D.....Minneapolis
†Corrigan, J. E.....Waycross, Ga.
Cosgriff, J. A.....Olivia
Counseller, V. S.....Rochester
Countryman, R. S.....St. Paul
Covell, W. W.....St. Peter
Coventry, M. B.....Rochester
Coventry, W. A.....Duluth
Coventry, W. D.....Duluth
Cowern, E. W.....North St. Paul
Cragg, R. W.....Rochester
Craig, C. C.....International Falls
Craig, W. McK.....Rochester
Cranmer, R. R.....Minneapolis
Cranston, R. W.....Minneapolis
Creevy, C. D.....Minneapolis
Crenshaw, J. L.....Rochester
Cress, P. J.....Ellsworth
Crewe, J. E.....Rochester
Critchfield, L. R.....St. Paul
Cronwell, B. J.....Austin
Crow, E. R.....Arlington
Crumpacker, L. K.....Rochester
Culligan. J. M.....St. Paul
Cunningham, B. P.....Rochester
Cunningham, C. B.....Virginia
Currens, J. H.....Rochester
Curtin, J. F.....Minneapolis
Curtis, R. A.....Le Center
Cusick, P. L.....Rochester
Cutts, George.....Minneapolis
Dack, L. G.....St. Paul
Dady, E. E.....Minneapolis
Dahl, E. O.....Minneapolis
Dahl, G. A.....Mankato

Dahl, J. A.....Minneapolis
Dahle, M. B.....Glenwood
Dahlin, I. T.....Aurora
Daignault, Oscar.....Benson
Daniel, D. H.....Minneapolis
Daniel, L. M.....Minneapolis
Danielson, K. A.....Litchfield
Danielson, Lennox.....Litchfield
Darling, J. P.....Des Moines, Ia.
†Daugherty, E. B..Marine-on-St. Croix
Daugherty, L. E.....St. Paul
Davies, L. T.....Rochester
Davies, R. J.....Nopeming
Davis, A. C.....Rochester
†Davis, Herbert.....St. Paul
Davis, I. G.....Rushford
Davis, J. C.....Minneapolis
Davis, L. F.....Wadena
Davis, L. T.....Wadena
Davis, R. D.....Clearbrook
Davis, T. C.....Wadena
†Davis, William .....St. Paul
Day, Lois A.....Rochester
Dearing, W. H., Jr.....Rochester
De Boer, Hermanus.....Edgerton
DeCourcey, D. M.....St. Paul
Dedolph, Karl.....St. Paul
†Dedolph, T. H.....Braham
Delavan, P. A.....St. Paul
Delmore, J. L., Jr.....Roseau
Delmore, J. L.....Roseau
del Plaine, C. W.....Minneapolis
Demo, P. W.....Wells
†Dempsey, D. P.....Kellogg
Denman, A. V.....Mankato
Derauf, B. I.....St. Paul
Desjardins, A. U.....Rochester
Devereaux, T. J.....Wayzata
Dewey, D. H.....Owatonna
Dickson, T. H.....St. Paul
Diehl, H. S.....Minneapolis
Diessner, H. D.....Minneapolis
Dippel, A. L.....Minneapolis
Dittman, G. C.....St. Paul
Dix, C. R.....Rochester
Dixon, C. F.....Rochester
Dockerty, M. B.....Rochester
Doehring, P. C., Jr...New Orleans, La.
Doering, R. E.....Minneapolis
Dolder, F. C.....Eyota
Doleman, N. F.....Tintah
Doman, V. W.....Lakefield
Doms. H. C. A.....Slayton
Donald, C. J., Jr.....Rochester
Donaldson, C. S.....Foley
Donohue, P. F.....St. Paul
Donovan, D. L.....Albert Lea
Doolittle, L. E.....Duluth
Dordal, John.....Sacred Heart
Dorge, R. I.....Minneapolis
Dornblaser, H. B.....Minneapolis
Dorsey, G. C.....Minneapolis
Dorton, H. E.....Rochester
Dovre, C. M.....St. Paul
Dowidat, R. W.....Minneapolis
Dowswell, W. J.....Kerkhoven
Doxey, G. L.....Minneapolis
Doyle, G. C.....Duluth
Doyle, L. O.....Minneapolis
Drake, C. B.....St. Paul
Drake, C. R.....Minneapolis
†Drake, F. A.....Lanesboro
Drapiewski, J. F.....Rochester
Dredge, H. P.....Sandstone
Drill, H. E.....Hopkins
Drips, Della G.....Rochester
Drought, W. W.....Fergus Falls
Dry, T. J.....Rochester
Dubbe, F. H.....New Ulm
Du Bois, J. F.....Sauk Centre
Duff, E. R.....Minneapolis
Dugan, L. F.....Faribault
Dukelow, D. A.....Minneapolis
Dumas, A. G.....Minneapolis
Duncan, J. W.....Moorhead
Dungay, N. S.....Northfield
Dunlap, E. H.....Minneapolis
Dunn, G. R.....Minneapolis
Dunn, J. N.....St. Paul
Duryea, W. M.....Minneapolis
†Dutton, C. E.....Minneapolis
Dvorak, B. A.....Minneapolis
Dwan, P. F.....Minneapolis
Dworsky, S. D.....Minneapolis
Dysterheft, A. F.....Gaylord
Earl, George .....St. Paul
Earl, J. R.....St. Paul
Earl, Robert.....St. Paul
East, John.....Northome
Eaton, L. M.....Rochester
Eaves, G. B.....Wabasso
Eberlin, E. A.....Glenwood

*Deceased
†Affiliate or Associate

Eckdale, J. E.....Lyle
Eckhardt, C. L.....Austin
Eckman, P. F.....Duluth
Eckman, R. J.....Duluth
Ederer, J. J.....Mahnomen
Edlund, Gustaf.....St. Paul
Edwards, J. W.....St. Paul
Edwards, R. T.....Elysian
Edwards, T. J.....St. Paul
Eginton, C. T.....Rochester
Ehni, G. J.....Rochester
Ehrenberg, C. J.....Minneapolis
Ehrlich, S. P.....Minneapolis
Eich, Matthew.....Minneapolis
Eiler, John.....Park Rapids
Eisenstadt, D. H.....Minneapolis
Eitel, G. D.....Minneapolis
Ekblad, J. W.....Duluth
Eklund, E. J.....Norwood
Elias, F. J.....Duluth
Elkins, E. C.....Rochester
Ellingson, A. R.....Detroit Lakes
Elliott, W. S.....Virginia
Ellis, E. W.....Elgin
Ellison, D. E.....Minneapolis
Ellison, F. E.....Monticello
Elsey, E. M.....Glenwood
Elsey, J. R.....Glenwood
Ely, O. S.....So. St. Paul
Emanuel, K. W.....Duluth
Emerson, E. C.....St. Paul
Emmerson, W. S.....Mayer
Emmett, J. L.....Rochester
Endress, E. K.....St. Paul
Engberg, E. J.....Faribault
Engdahl, F. W.....Ortonville
Engh, Sigfred.....Jackson
Englehart, P. C.....Minneapolis
English, J. P.....Rochester
Engstrand, O. J.....Minneapolis
Engstrom, G. F.....Belgrade
Eppard, R. M.....Cloquet
*Erdmann, C. A.....Minneapolis
Erich, J. B.....Rochester
Erickson, C. O.....Rochester
Erickson, Eskil.....Halstad
Erickson, E. W.....Minneapolis
Erickson, R. E.....Hector
Erickson, R. F.....Minneapolis
Ericson, R. M.....Minneapolis
Ericson, Swan, ...Le Sueur
Ernest, G. C. H.....So. St. Paul
Erskine, G. M.....Grand Rapids
Ertel, E. Q.....Ellendale
†Eshelby, E. C.....St. Paul
Esser, John .....Perham
Esser, O. J.....Gibbon
Estrem, C. O.....Fergus Falls
Estrem, T. A.....Hibbing
Eusterman, G. B.....Rochester
Evans, E. T.....Minneapolis
Evans, L. M.....Sauk Rapids
Evans, R. D.....Minneapolis
Evarts, A. B.....Rochester
Ewens, H. B.....Virginia
Ewing, C. F.....Wheaton
Eyres, T. E.....Pequot

Faber, J. E.....Rochester
Fahey, E. W.....St. Paul
Fahr, G. E.....Minneapolis
Fait, R. V.....Little Falls
Fankboner, A. V.....Buhl
Fansler, W. A.....Minneapolis
Farrish, R. C.....Sherburn
Fawcett, A. M.....Renville
Fawcett, K. R.....Duluth
Feeney, J. M.....Minneapolis
Feinstein, J. Y.....Grove City
Feldman, F. M.....Rochester
Fellows, M. F.....Duluth
Fenger, E. P. K.....Oak Terrace
Fenstermacher, R. H.....Rochester
Ferguson, F. F.....Rochester
Ferguson, J. C.....St. Paul
Ferguson, W. J., Jr.....Rochester
Ferris, D. O.....Rochester
Fesenmaier, O. B.....New Ulm
Fesler, H. H.....St. Paul
Fetterly, Warren.....Minneapolis
Feuling, J. C.....Bovey
Figi, F. A.....Rochester
Fink, L. W.....Minneapolis
Fink, W. H.....Minneapolis
Fischer, M. McC.....Duluth
Fischer, M. S.....Minneapolis
Fishback, C. F.....Rochester
Fisher, I. I.....Ceylon

*Deceased
†Affiliate or Associate

Fisketti, Henry.....Duluth
†Fitzgerald, D. F.....Minneapolis
Fitzgerald, E. T.....Morris
Fitzsimons, W. E.....Brainerd
Fjeldstad, C. A.....Minneapolis
Flanagan, H. F.....St. Paul
Flanagan, L. G.....Austin
Flancher, L. H.....Lake Park
Fleming, A. S.....Minneapolis
Fleming, T. N.....St. Cloud
Flesche, B. A.....El Paso, Tex.
Flinn, T. E.....Redwood Falls
Flom, M. G.....Zumbrota
Fogarty, C. W., Jr.....Rochester
Fogarty, C. W.....St. Paul
Fogelberg, E. J.....St. Paul
Foley, F. E. B.....St. Paul
Folken, F. G.....Albert Lea
Forbes, R. S.....Duluth
Ford, B. C.....Marshall
Ford, W. H.....Minneapolis
Foshager, H. T.....Clara City
Foster, M. A.....Rochester
Foster, W. K.....Minneapolis
Fowler, L. H.....Minneapolis
Franchere, F. W.....Lake Crystal
Francis, D. W.....Morristown
Frane, D. B.....Minneapolis
Frank, J. E.....Marshall
Fredericks, G. M.....Minneapolis
Frederickson, Alice C.....Willmar
Frederickson, G. U. Y.....Willmar
Fredlund, M. L.....Milaca
Freeman, C. D.....St. Paul
Freeman, G. H.....St. Peter
Freeman, J. P.....Albert Lea
Freeman, W. L.....St. Cloud
Freeman, W. N.....Perham
Friedman, L. L.....St. Paul
Freligh, W. P.....Albert Lea
Fricke, R. E.....Rochester
Friedell, Aaron.....Minneapolis
Friedell, George.....Ivanhoe
Friedell, M. T.....Rochester
Friesleben, William.....Sauk Rapids
Frisch, F. P.....Willmar
Fritsche, Albert.....New Ulm
Fritsche, C. J.....New Ulm
Fritsche, T. R.....New Ulm
Fritz, W. L.....St. Paul
Fritzell, K. E.....Minneapolis
Froats, C. W. .....St. Paul
Frost, E. H.....Willmar
Frost, H. T.....Wadena
Frost, J. B.....Minneapolis
Fugina, G. R.....Mankato
Fuller, Alice H.....Minneapolis
Funk, V. K.....Oak Terrace

Gaarde, F. W.....Rochester
Gager, E. C.....St. Paul
Gaida, J. B.....St. Cloud
Gaines, E. C.....Buffalo Lake
Gallagher, B. J.....Waseca
Galloway, J. B.....Minneapolis
Gambill, E. E.....Rochester
Gamble, J. W.....Albert Lea
Gamble, P. M.....Albert Lea
Gammell, J. H.....Minneapolis
Garbrecht, A. W..... St. Paul
Gardiner, D. G.....St. Paul
Gardner, E. L.....Minneapolis
Gardner, V. H.....Fairmont
Gardner, W. P.....Anoka
Garlock, A. V.....Bemidji
Garlock, D. H.....Bemidji
Garten, J. L.....Minneapolis
Gaviser, David.....Princeton
Geer, E. K.....St. Paul
Gehlen, J. N.....St. Paul
Geist, G. A.....St. Paul
Gendron, J. F. X.....Grand Rapids
Gerber, M. P.....Brainerd
Germo, Charles.....Balaton
Ghent, C. H.....St. Paul
Ghormley, R. K.....Rochester
Ghostley, Mary C.....Puposky
Gibbons, F. C.....Comfrey
Gibbs, E. C.....St. Paul
Giere, E. O.....Minneapolis
Giere, J. C.....Minneapolis
Giere, R. W.....Minneapolis
Giere, S. W.....Benson
Giesen, A. F.....Starbuck
†Giessler, P. W.....Minneapolis
Giffin, H. M.....Rochester
Giffin, H. Z.....Rochester
Giffin, L. A.....Alton, Ill.
Gifford, B. L.....Long Prairie
Gilbert, M. G. .....Minneapolis
†Gilfillan, J. S.....St. Paul
Gilkey, S. E.....St. Paul

Gilles, F. L.....Minneapolis
Gillespie, M. G.....Duluth
Gillespie, N. H.....Duluth
Gilman, L. C.....Atwater
†Gilmore, Rowland.....Bemidji
Gingold, B. A.....Minneapolis
Ginsberg, William.....St. Paul
Girvin, R. B.....Minneapolis
Glabe, R. A.....Plainview
Glomset, D. A.....Rochester
Goblirsch, A. P.....Sleepy Eye
Goehrs, G. H.....St. Cloud
Goehrs, H. W.....St. Cloud
Golberg, M. L.....Minneapolis
Goldberg, I. M.....Minneapolis
Golden, R. F.....Rochester
Goldish, D. R.....Duluth
Goldman, T. I.....Minneapolis
Goldner, M. Z.....Minneapolis
Goltz, E. V.....St. Paul
Good, C. A., Jr.....Rochester
Good, H. D.....Minneapolis
Goodman, C. E.....Virginia
Gordon, P. E.....Minneapolis
Gore, H. R.....Rochester
Gorman, W. A...San Francisco, Calif.
Goss, H. C.....Glencoe
Gosslee, G. L.....Moorhead
Gowan, L. R.....Duluth
†Graham, Robert .....Duluth
Grahek, J. P.....Ely
Grandy, A. Margaret.....Rochester
Grant, H. W.....St. Paul
Grant, Russel.....Rochester
†Gratzek, F. R.....Minneapolis
Gratzek, Thomas.....St. Paul
Grau, R. K.....St. Paul
Grave, Floyd.....Minneapolis
Graves, R. B.....Red Wing
Graves, W. N.....Duluth
Gray, F. D.....Marshall
Gray, H. K.....Rochester
Gray, R. C.....Minneapolis
Gray, R. F.....Marshall
Greene, L. F.....Rochester
Greenfield, W. T.....Delano
Griffin, P. J.....Fertile
Grimes, H. B.....Madelia
Grimes, Marian.....Minneapolis
Grinnell, W. B.....Preston
Grise, W. B.....Austin
Griswold, F. E.....Hoffman
Groff, J. E.....Rochester
Grogan, J. S.....Wadena
Gronvall, P. R.....Minneapolis
Groschupf, T. P. E.....Bemidji
Grose, F. N.....Clarissa
Gruenhagen, A. P.....St. Paul
Grundset, O. J.....Montrose
Gullixson, Andrew.....Albert Lea
Gully, R. J.....Cambridge
Gunderson, N. A.....Minneapolis
Gunderson, R. M.....Lake Park
Gushurst, E. G.....Minneapolis
Gustason, H. T.....Minneapolis

Habein, H. C.....Rochester
Haberman, Emil.....Osakis
†Hacking, F. H.....Minneapolis
Haes, J. E.....Vernon Center
Haessly, S. B.....Faribault
Hagaman, G. K.....St. Paul
Hagen, O. E.....Butterfield
Hagen, O. J.....Moorhead
†Haggard, G. D.....Minneapolis
Haight, G. G.....Audubon
Haines, J. H.....Stillwater
Haines, S. F.....Rochester
Haisten, A. S.....Rochester
Halenbeck, P. L.....St. Cloud
Hall, A. R.....St. Paul
Hall, B. E.....Rochester
Hall, H. H.....St. Paul
Hall, J. M.....Minneapolis
Halladay, G. J.....Brainerd
Hallberg, C. A.....Minneapolis
Hallenbeck, D. F.....Rochester
Hallenbeck, G. A.....Rochester
Haller, W. M.....Bemidji
Hallock, Philip .....Minneapolis
Halloran, W. H.....Jackson
Halpern, D. J.....Brewster
Halpin, J. E.....Rush City
Hamel, A. L.....Minneapolis
*Hamilton, A. S.....Minneapolis
Hamlin, G. B.....Minneapolis
Hamlon, J. S.....St. Charles
Hammar, L. M.....Butterfield
Hammer, H. J.....Detroit, Mich.
Hammermeister, T. F.....New Ulm
Hammerstad, L. M.....Minneapolis

Hammes, E. M.....St. Paul
Hammond, A. J. H.....Minneapolis
Hammond, J. F.....St. Paul
Hampton, H. P.....Rochester
Haney, C. L.....Duluth
Hankerson, R. G.....Minnesota Lake
Hannah, H. B.....Minneapolis
Hanover, R. D.....Littlefork
Hansen, C. O.....Minneapolis
Hansen, E. W.....Minneapolis
Hansen, Olga S.....Minneapolis
Hansen, Rorbye .....Monticello
Hanson, A. M.....Faribault
Hanson, E. O.....Cloquet
Hanson, E. C.....New York Mills
Hanson, H. B. .....St. Paul
Hanson, H. J.....Minneapolis
Hanson, H. V.....Minneapolis
Hanson, M. B.....Minneapolis
Hanson, W. A. H.....Minneapolis
Hargraves, M. M.....Rochester
Harley, R. D.....Rochester
Harlow, H. D. .....Virginia
Harmon, G. E.....St. Paul
Harper, H. P.....Rochester
Harper, S. B.....Rochester
Harriman, Leonard.....Howard Lake
Harrington, C. D.....Minneapolis
Harrington, F. E.....Minneapolis
Harrington, S. W.....Rochester
Harris, C. N.....Hibbing
Harrison, P. W.....Worthington
Hart, V. L.....Minneapolis
Hart, W. E.....Monticello
Hartfiel, W. F.....St. Paul
Hartley, E. C.....St. Paul
Hartman, H. R.....Rochester
Hartmann, C. M.....Fairfax
Hartnagel, G. F.....Red Wing
Hartung, E. H.....Claremont
†Hartzell, T. B.....Minneapolis
Haskell, A. D.....Alexandria
Hassett, M. F.....St. Paul
Hassett, R. G.....Mankato
Hastings, D. R.....Minneapolis
Hatch, W. E.....Duluth
Hathaway, S. J.....Proctor
Hauge, E. T.....Minneapolis
Hauge, M. I.....Clarkfield
Haugen, J. A.....Minneapolis
Haugseth, Enoch.....Twin Valley
Hauser, V. P.....St. Paul
Hausmann, P. F.....Rochester
Havel, H. W.....Jordan
Havel, T. E.....Blue Earth
Haven, W. K.....Minneapolis
Havens, F. Z.....Rochester
Havens, J. G. W.....Austin
†Haverfield, Addie R.....Minneapolis
*Hawkins, V. J.....St. Paul
Hawkinson, J. P.....Crosby
Hawkinson, R. P.....Minneapolis
Hayden, R. O.....Rochester
Hayes, J. M.....Minneapolis
Hayes, M. F.....Nashwauk
Hays, A. T.....Minneapolis
Head, D. P.....Minneapolis
Head, G. D.....Minneapolis
†Heath, A. C.....Stillwater
Hebbel, Robert.....Windom
Hebeisen, M. B.....Chaska
Heck, F. J.....Rochester
Heck, W. W.....St. Paul
Hedback, A. E.....Minneapolis
Hedberg, G. A.....Nopeming
Hedemark, H. H...Thief River Falls
Hedenstrom, F. G.....St. Paul
Hedenstrom, L. H.....Cambridge
Hedin, R. F.....Red Wing
Heersema, P. H.....Rochester
Hegge, O. H.....Austin
Hegge, R. S.....Austin
Heiam, W. C.....Cook
Heiberg, E. A.....Fergus Falls
Heilman, Charles.....Rochester
Heilman, Dorothy M. H.....Rochester
Heilman, F. R.....Rochester
Heim, R. R.....Minneapolis
Heimark, J. J.....Fairmont
Heise, Herbert .....Winona
Heise, W. F. C.....Winona
Heise, W. V.....Winona
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Helmholz, H. F.....Rochester
Helseth, H. K.....Thief River Falls
Hempstead, B. E.....Rochester
†Hemstead, Werner.....Brainerd

Hench, P. S.....Rochester
Henderson, A. J. G.....Kiester
Henderson, J. W.....Rochester
Henderson, M. S.....Rochester
Hendricks, Esten.....Minneapolis
Hendrickson, J. F.....Minneapolis
Hendrickson, R. R.....Wabasha
Hengstler, W. H.....St. Paul
Henney, W. H.....McIntosh
Henriksen, H. G.....Northfield
Henrikson, E. C.....Minneapolis
†Henry, C. E.....Kirksville, Mo.
Henry, C. J.....Milaca
Henry, M. O.....Minneapolis
Henry, M. R.....Cottonwood
Hensel, C. N.....St. Paul
Henslin, A. E.....Le Roy
Herbert, W. L.....Granite Falls
Herbst, R. F.....Wykoff
Herman, A. L.....Minneapolis
Herman, Samuel.....St. Paul
Hermanson, P. E.....Hendricks
Heron, R. C.....St. Paul
Herrell, W. E.....Rochester
Herrmann, E. T.....St. Paul
Hertel, G. E.....Austin
Hertz, M. J.....St. Paul
Hewitt, Edith S.....Rochester
†Hewitt, R. M.....Rochester
†Heyerdale, O. C.....Rochester
Heyerdale, W. W.....Rochester
Hiebert, H. L.....Ah-Gwah-Ching
*Hiebert, J. P.....Minneapolis
Higgs, W. W.....Park Rapids
Higgins, J. H.....Minneapolis
Higginson, J. F.....Rochester
Hildebrand, Alice G.....Rochester
Hilding, A. C.....Duluth
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
Hilger, J. A.....St. Paul
Hilger, L. A.....St. Paul
Hill, Eleanor J.....Minneapolis
Hill, F. E.....Duluth
Hill, J. R.....Rochester
Hilleboe, H. E.....St. Paul
Hillis, S. J.....Minneapolis
Hinckley, R. G.....Minneapolis
Hines, E. A., Jr.....Rochester
Hiniker, L. P.....St. Paul
Hiniker, P. J.....Le Sueur
Hinshaw, H. C.....Rochester
Hirschboeck, F. J.....Duluth
†Hirschfelder, A. D.....Minneapolis
†Hirschfield, M. S.....Duluth
Hirshfield, F. R.....Minneapolis
Hitchings, W. S.....Lakefield
Hoaglund, A. W.....Minneapolis
†Hobbs, C. A.....Minneapolis
Hochfilzer, J. J.....St. Paul
Hodapp, R. J.....Willmar
Hodge, S. V.....Minneapolis
Hoff, Alfred .....St. Paul
Hoff, H. O.....Duluth
Hoffert, H. E.....Minneapolis
Hoffman, M. H.....St. Paul
Hoffman, R. A.....Minneapolis
Hoffman, W. L.....Minneapolis
Hoffmann, H. O. E.....Rochester
Hoidale, A. D.....Tracy
*Holbrook, J. S.....Mankato
Holcomb J. T.....Marine-on-St. Croix
Holcomb, O. W.....St. Paul
*Holdridge, G. A.....Foley
†Holl, P. M.....Minneapolis
Hollands, W. H.....Fisher
Holm, H. H.....Glencoe
†Holm, P. F.....Wells
Holmberg, C. J.....Minneapolis
Holmberg, L. J.....Canby
Holmen, R. W.....St. Paul
Holmes, A. E.....Rush City
Holmstrom, C. H.....Warren
Holt, J. E.....St. Paul
Holt, W. B. .....Minneapolis
Holtan, Theodore.....Waterville
Holzapfel, F. C.....Minneapolis
Hopkins, G. W.....St. Paul
Horton, B. T.....Rochester
Hottinger, R. C.....Janesville
Houkom, Bjarne.....Minneapolis
House, Z. E.....Cass Lake
Houston, D. M.....Park Rapids
Hovde, Rolf.....Winthrop
Hovland, M. L.....Minneapolis
Howard, M. A.....St. Paul
Howard, M. I.....Mankato
Howard, W. S.....St. Paul
Howe, R. F.....Rochester
Howell, L. P.....Rochester
Hoyer, L. J.....Windom
Hubbard, O. E.....Brainerd

Hubin, E. G.....Deerwood
Hudec, E. R.....Echo
Hudson, G. E.....Minneapolis
Huenekens, E. J.....Minneapolis
Huffington, H. L.....Mankato
Hughes, T. J.....Rochester
Hullsiek, H. E.....St. Paul
Hullsiek, R. B.....St. Paul
Hultkrans, J. C.....Minneapolis
Hultkrans, R. E.....Minneapolis
Hummer, G. J.....Rochester
Humphrey, E. W.....Moorhead
Humphrey, W. R.....Stillwater
Hunt, A. B.....Rochester
Hunt, R. C.....Fairmont
Hunt, R. S.....Fairmont
Hunte, A. F.....Tempe, Ariz.
Hurd, Annah.....Minneapolis
Hursh, M. M.....Hibbing
Hutchinson, C. J.....Minneapolis
Hutchinson, Henry.....Moose Lake
Huxley, F. R.....Faribault
Hymes, Charles.....Minneapolis
Hynes, J. E.....Minneapolis

Ide, A. W.....St. Paul
Ide, L. W.....St. Paul
Ikeda, Kano.....St. Paul
Ingebrigtson, E. K. G.....Moorhead
Ingerson, C. A.....St. Paul
Irvine, H. G.....Minneapolis
Ittner, G. W., Jr.....St. Paul
Iverson, R. M.....Rochester
Ivie, J. McK.....Rochester

Jackman, R. J.....Rochester
†Jackson, C. M.....Minneapolis
Jacobs, D. L.....Willmar
Jacobs, G. C.....Fergus Falls
Jacobs, J. C.....Willmar
Jacobson, C. E., Jr.....Rochester
Jacobson, Clarence.....Chisholm
Jacobson, D. J.....Bemidji
Jacquot, G. L.....Marshall
Jamieson, E. F.....Brainerd
Jarvis, B. W.....Lowry
Jennings, Mary H.....Minneapolis
*Jensen, A. H.....Hutchinson
Jensen, A. M.....Brownton
Jensen, H. C.....Minneapolis
Jensen, M. J.....Minneapolis
Jensen, R. A.....Minneapolis
Jensen, T. J.....Duluth
Jesion, J. W.....St. Paul
Johanson, W. G.....St. Paul
Johnson, A. B.....Minneapolis
Johnson, A. E.....Red Wing
Johnson, A. E.....Minneapolis
Johnson, A. M.....St. Paul
Johnson, A. R.....Isanti
Johnson, C. E.....St. Paul
Johnson, C. M.....Dawson
Johnson, D. L.....Little Falls
Johnson, D. W.....Fairmont
Johnson, E. W.....Bemidji
Johnson, E. W.....Minneapolis
Johnson, H. C.....North Mankato
Johnson, H. C.....Thief River Falls
Johnson, Hans.....Kerkhoven
Johnson, H. A.....Minneapolis
†Johnson, H. P.....Fairmont
Johnson, H. P.....Harmony
Johnson, J. A.....St. Paul
Johnson, J. A.....Minneapolis
Johnson, Julius.....Minneapolis
Johnson, J. W.....Kerkhoven
Johnson, K. E.....Duluth
Johnson, M. R.....Red Wing
†Johnson, N. A.....Minneapolis
Johnson, N. P.....Minneapolis
Johnson, N. T.....Minneapolis
Johnson, O. H.....Redwood Falls
Johnson, Olga H.....Moorhead
Johnson, O. V.....Fergus Falls
Johnson, P. C.....Tyler
Johnson, R. A.....Minneapolis
Johnson, R. B.....Lanesboro
Johnson, R. E.....Minneapolis
Johnson, R. E.....Worthington
Johnson, R. G.....Stillwater
†Johnson, T. H...San Francisco, Calif.
Johnson, V. M.....Dawson
Johnson, Walfred.....Sauk Centre
Johnson, W. E.....Morgan
Johnson, Y. T....Camp Claiborne, La.
Johnsrud, L. W.....Minneapolis
Johnston, L. F.....Slayton
Jolin, F. M.....Bovey
Jolin, R. V.....Grand Rapids
Jones, A. W.....Red Wing

*Deceased
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Jones, E. M.....St. Paul
*Jones, G. M.....Minneapolis
*Jones, H. W.....Minneapolis
Jones, H. W., Jr...Camp Claiborne, La.
Jones, O. H.....Madison Lake
Jones, R. N.....St. Cloud
Jones, W. R.....Minneapolis
Jordan, L. S.....Granite Falls
Josewich, Alexander.....Minneapolis
Josewski, R. J.....Stillwater
Joss, C. S.....Rochester
Joyce, G. L.....Rochester
Judd, D. B.....Rochester
Judd, E. S., Jr.....Rochester
Juergens, H. M.....Belle Plaine
Juers, E. H.....Red Wing
Juliar, R. O.....St. Clair
Jump, W. C.....Kasson
Just, H. J.....Lafayette

Kaasa, L. J.....Albert Lea
Kalin, O. T.....Minneapolis
Kalinoff, Demeter.....Stillwater
Kallestad, L. L.....Hutchinson
Kamman, G. R.....St. Paul
Kamp, B. A.....Albert Lea
Kannary, E. L.....St. Paul
Kanne, C. W.....Faribault
Kapernick, J. S.....Rochester
Kaplan, D. H.....St. Paul
Karlstrom, A. E.....Minneapolis
Karn, B. R.....Ortonville
Karon, I. M.....St. Paul
Kasper, E. M.....St. Paul
Kath, R. H.....Woodlake
Kaufman, E. J.....Appleton
Kaufman, W. B.....Mankato
Kaufman, W. C.....Appleton
Kearney, R. W.....Mankato
Keating, F. R., Jr.....Rochester
Keefe, R. E.....St. Paul
Keith, H. M.....Rochester
Keith, N. M.....Rochester
Keithahn, E. E.....Kimball
Kelby, G. M.....Minneapolis
Kelly, A. C.....Duluth
Kelly, J. V.....St. Paul
Kelly, P. H.....St. Paul
Kelsey, C. G.....Hinckley
Kelsey, M. P.....Rochester
Kemp, A. F.....Mankato
Kemp, M. W.....Moose Lake
Kenefick, E. V.....St. Paul
Kennedy, C. C.....Minneapolis
Kennedy, Jane F.....Minneapolis
Kennedy, R. L. J.....Rochester
Kennedy, W. A.....St. Paul
Kent, R. N.....Rochester
Kenyon, T. J.....St. Paul
Kepler, E. J.....Rochester
Kerkhof, A. C.....Minneapolis
Kerlan, Irvin.....Washington, D. C.
Kern, M. C.....Freeport
*Kern, M. J.....St. Cloud
Kernohan, J. W.....Rochester
Kerschbaumer, Luisa.....St. Peter
Kertesz, Geza.....Minneapolis
Kesting, Herman.....St. Paul
Kettlewell, R. B.....Sauk Centre
Keyes, J. D.....Winona
Kibbe, O. A.....Minneapolis
Kibler, J. M.....Lakeland, Fla.
Kierland, P. E.....Alexandria
Kierland, R. R.....Rochester
Kiesling, I. H.....Coleraine
Kilbride, E. A.....Worthington
Kilbride, J. S.....Worthington
Killins, J. A.....Rochester
Kimmel, G. C., Jr.....Red Wing
†King, E. A.....Minneapolis
King, G. L.....St. Paul
King, H. E.....Rochester
King, H. T.....Minneapolis
King, W. L. M.....Rochester
Kingsbury, E. M.....Clearwater
Kinsella, T. J.....Minneapolis
Kirk, G. P.....East Grand Forks
Kirklin, B. R.....Rochester
Kirklin, O. L.....Rochester
Kistler, A. J.....Minneapolis
Kistler, C. M.....Minneapolis
Klein, Harry.....Duluth
Klein, H. N.....St. Paul
Klein, J. C.....Shakopee
Klima, W. W.....Stewart
Knapp, F. N.....Duluth
Knapp, M. E.....Minneapolis
Knauff, M. K.....St. Paul

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Knight, R. R.....Minneapolis
Knight, R. T.....Minneapolis
Knights, J. A.....Bemidji
Knutson, G. A.....Greenbush
Koelsche, G. A.....Rochester
Koenigsberger, Charles.....Mankato
Koepcke, G. M.....Minneapolis
Koepsell, A. A. H.....St. Paul
Kohlbry, C. O.....Duluth
Kohler, D. W.....St. Joseph
Kolars, J. J.....Le Center
Koller, H. M.....Minneapolis
Koller, L. R.....Minneapolis
Koop, S. H.....Richmond
Korchik, J. P.....Minneapolis
Kortsch, F. P.....Prior Lake
Kostick, W. R.....Fertile
Kotchevar, F. R.....Eveleth
Koucky, R. W.....Minneapolis
Kozberg, Oscar.....Moose Lake
Kraft, Peter.....Duluth
Krause, C. W.....Fairmont
Kreuzer, T. C.....Owatonna
Krusen, F. H.....Rochester
Kucera, F. J.....Hopkins
Kucera, L. J.....Lonsdale
Kucera, S. T.....Lonsdale
Kucera, W. J.....Minneapolis
Kugler, A. A.....St. Paul
Kuhlmann, August.....Melrose
Kusske, A. L.....New Ulm
Kuth, J. R.....Duluth
Kvale, W. F.....Rochester
Kvitrud, Gilbert.....St. Paul
Kyser, F. A.....Rochester

La Bree, R. H.....Chisholm
Laird, A. T.....Nopeming
Lajoie, J. M.....Minneapolis
Lamb, H. L.....Little Falls
Lander, H. H.....Rochester
Lang, L. A.....Minneapolis
Langenderfer, F. V.....St. Paul
Lannin, J. C.....Mabel
Lapierre, A. P.....Minneapolis
Lapierre, J. T.....Minneapolis
Larsen, C. L.....St. Paul
Larsen, F. W.....Minneapolis
Larsen, O. O.....Detroit Lakes
Larson, Arnold.....Detroit Lakes
Larson, C. M.....Minneapolis
Larson, J. T.....Lake Wilson
Larson, L. J.....Bagley
Larson, L. M.....Minneapolis
Larson, L. M.....Oak Terrace
Larson, M. H.....Nicollet
Larson, P. N.....Minneapolis
Lauer, D. J.....St. Paul
La Vake, R. T.....Minneapolis
Lax, M. H.....St. Paul
Laymon, C. W.....Minneapolis
Layne, J. A.....Minneapolis
Lazar, H. L.....Minneapolis
Leahy, Bartholomew.....St. Paul
Leary, W. V.....Rochester
Leavenworth, R. O.....St. Paul
†Leavitt, H. H.....Minneapolis
Lebowske, J. A.....Minneapolis
Leck, P. C.....Austin
Leddy, E. T.....Rochester
Lee, H. M.....Minneapolis
Lee, H. W.....Brainerd
Lee, J. L.....Watertown
Lee, W. A.....Fergus Falls
Lee, W. N.....Madison
Leemhuis, G. H.....McGregor
Lehnhoff, H. J., Jr.....Rochester
Leibold, H. H.....Parkers Prairie
Leick, R. M.....St. Paul
Leighton, Robert .....Evansville
Leitch, Archibald.....St. Paul
Leitch, N. M.....Warroad
Leland, H. R.....Minneapolis
Leland, J. T.....Herman
Lemon, W. S.....Rochester
Lenander, M. E.....St. Peter
Lenarz, A. J.....Browerville
Lende, Norman.....Faribault
Lenont, C. B.....Virginia
Lenz, J. R.....Morton
Lenz, O. A.....Minneapolis
Leonard, L. J.....Minneapolis
Leonard, Samuel.....Minneapolis
Leopard, B. A.....Albert Lea
Lepak, F. J.....Duluth
Lepak, J. A.....St. Paul
†Lerche, William.....Cable, Wis.
Leven, N. L.....St. Paul
Levin, B. G.....St. Paul
Levitt, G. X.....St. Paul
Lewis, A. J.....Henning

Lewis, C. B.....St. Cloud
Lexa, F. J.....Lonsdale
Libert, J. N.....St. Cloud
Lick, C. L.....St. Paul
Liedloff, A. G.....Mankato
Lien, R. J.....Rochester
Liffrig, W. W.....Goodhue
Lightbourn, E. L.....St. Paul
Lillehei, E. J.....Robbinsdale
Lillie, H. I.....Rochester
Lima, L. R.....Montevideo
Lind, C. J.....Minneapolis
Lindahl, W. W.....Rochester
Lindberg, A. C.....Minneapolis
Lindberg, A. L.....Wheaton
Lindberg, V. L.....Minneapolis
Linde, Herman.....Cyrus
Lindquist, R. H.....Minneapolis
Lindsay, W. V.....Winona
Linner, H. P.....Minneapolis
†Linton, W. B.....Minneapolis
Lippman, E. S.....Minneapolis
Lippman, H. S.....St. Paul
Lippmann, E. W.....Hutchinson
Lipschultz, Oscar.....Minneapolis
Lipscomb, P. R.....Rochester
Litchfield, J. T.....Minneapolis
Litman, A. B.....Minneapolis
Litman, S. N.....Duluth
Little, A. G., Jr.....Rochester
Little, E. H.....Rochester
Little, W. J.....St. Paul
Litzenberg, J. C.....Minneapolis
Lloyd, H. J.....Mankato
†Lochead, D. C.....Rochester
Logan, A. H.....Rochester
Logan, G. B.....Rochester
Logefeil, R. C.....Minneapolis
Lohmann, J. G.....Jasper
Loken, S. M.....St. Paul
Loken, Theodore.....Ada
Lommen, P. A.....Austin
†Long, Jesse.....Minneapolis
Loofbourrow, E. H.....Keewatin
Loomis, E. A.....Minneapolis
Loomis, G. L.....Winona
Love, F. A.....Carlos
Love, J. G.....Rochester
Love, W. R.....Rochester
Lovelace, W. R.....Rochester
Lovelady, S. B.....Rochester
Lovering, Joseph.....Rochester
Lowe, E. R.....So. St. Paul
Lowe, T. A.....So. St. Paul
Lowry, Elizabeth C.....Minneapolis
Lowry, Thomas .....Minneapolis
Luck, Hilda.....Mankato
Luckey, C. A.....Rochester
Luden, Georgine
Victoria, B. C., Canada
Lueck, A. G.....Rochester
Luedtke, G. H.....Fairmont
Lufkin, C. D.....Northfield
Lufkin, N. H.....Minneapolis
Lund, C. J. T.....Underwood
Lund, W. J.....Staples
Lundberg, Ruth I.....Minneapolis
Lundblad, R. A.....Minneapolis
Lundblad, S. W.....Minneapolis
Lundgren, A. C.....Minneapolis
Lundholm, A. M.....St. Paul
Lundquist, E. F.....Minneapolis
Lundy, J. S.....Rochester
Lutz, E. H.....Willmar
Lyght, C. E.....Northfield
Lyman, R. W.....Rochester
Lynch, F. W.....St. Paul
Lynch, M. J.....Minneapolis
Lynch, R. C.....Rochester
Lynde, O. G.....Thief River Falls
Lysne, Henry.....Minneapolis
Lysne, Myron.....Minneapolis

Macbeth, J. L.....St. Clair
†MacCarty, W. C.....Rochester
MacCarty, W. C., Jr.....Rochester
MacDonald, A. E.....Minneapolis
MacDonald, D. A.....Minneapolis
Macey, H. B.....Rochester
Macfarlane, P. H.....Chisholm
Mach, F. B.....Minneapolis
MacKay, A. R.....Spokane, Wash.
MacKay, H. J.....Rochester
MacKinnon, D. C.....Minneapolis
Macklin, W. E., Jr.....Litchfield
MacLean, A. R.....Rochester
MacMillan, D. G.....Triumph
Macnie, J. S.....Minneapolis
MacRae, G. C.....Duluth
Madden, J. F.....St. Paul
Madding, G. F.....Rochester
Mader, J. W.....Rochester

Maeder, E. C.....Minneapolis
Maertz, W. F.....New Prague
Magath, T. B.....Rochester
Magney, F. H.....Duluth
Magnusen, A. E.....Graceville
Mahle, D. G.....Plainview
Mahowald, Aloys.....Albany
Maino, C. R.....Rochester
Maitland, D. P.....Jackson
Maitland, E. T.....Jackson
Maland, C. O.....Minneapolis
Malerich, J. A.....Shakopee
Malmstrom, J. A.....Virginia
Manley, J. R.....Duluth
†Mann, F. C.....Rochester
†Manson, F. M.....Worthington
†Marcley, W. J.....Minneapolis
*Marcum, E. H.....Bemidji
Mariette, E. S.....Oak Terrace
Mark, D. B.....Minneapolis
Mark, Hilbert.....Minneapolis
Marking, G. H.....Osseo
†Markoe, J. C.....St. Paul
Marks, R. W.....St. Paul
Martin, T. P.....Arlington
Martin, W. C.....Duluth
Martineau, J. L.....St. Paul
Martinson, C. J.....Wayzata
Mason, J. A.....Little Rock, Ark.
Masson, D. M.....Rochester
Masson, J. C.....Rochester
†Matchan, G. R.....Minneapolis
Matthews, Justus.....Minneapolis
Mattill, P. M.....Oak Terrace
Mattison, P. A.....Winona
Mattson, C. H.....St. Paul
Mattson, H. A. N.....Minneapolis
Maxeiner, S. R.....Minneapolis
May, W. H.....Minneapolis
Mayne, R. M.....Duluth
Mayo, C. W.....Rochester
Maytum, C. K.....Rochester
McBroom, D. E.....Cambridge
McCain, D. L.....St. Paul
McCall, C. H.....Rochester
McCallig, J. J.....Rochester
McCann, D. F.....Bemidji
McCannel, D. A.....Rochester
McCarten, F. M.....Stillwater
McCarthy, Donald.....Minneapolis
McCarthy, J. J.....St. Paul
McCarthy, W. J.....Madelia
McCarthy, W. R.....St. Paul
McCartney, J. S.....Minneapolis
McCarty, P. D.....Ely
McClanahan, J. H...White Bear Lake
McClanahan, T. S...White Bear Lake
†McComb, C. F.....Duluth
†McCoy, Mary K.....Duluth
McCullough, J. A. L.....Rochester
McDaniel, Orianna.....Minneapolis
McDaniel, S. P.....Virginia
McDonald, A. L.....Duluth
McDonald, J. R.....Rochester
McDonough, F. E.....Rochester
McDowell, J. P.....St. Cloud
McElmeel, E. F.....Pipestone
McEnaney, C. T.....Owatonna
McEwan, Alexander.....St. Paul
McFarland, A. H.....Minneapolis
McGandy, R. F.....Minneapolis
McGeary, G. E.....Minneapolis
McGroarty, J. J.....Easton
McGuigan, H. T.....Red Wing
McHaffie, O. L.....Duluth
McHeffy, G. J.....Billings, Mont.
McInerny, M. W.....Minneapolis
McIntire, H. M.....Waseca
†McIntyre, George..San Marino, Calif.
McIntyre, J. A.....Owatonna
McIver, B. A.....Lowry
McKaig, C. B.....Pine Island
McKelvey, J. L.....Minneapolis
McKenna, J. K.....Austin
McKenna, M. J.....Grand Rapids
McKenzie, C. H.....Minneapolis
McKeon, J. O.....Montgomery
McKinlay, C. A.....Minneapolis
McKinley, J. C.....Minneapolis
McKinney, F. S.....Minneapolis
McKinnon, D. A., Jr.....Rochester
McLane, Evelyn G.....Jackson
McLane, W. O.....Perham
†McLaren, Jennette M.....Minneapolis
McLaughlin, E. M.....Winona
McLennan, C. E.....Minneapolis
McLeod, J. L.....Grand Rapids
McLoughlin, C. J.....Rochester
McMahon, L. H.....Breckenridge
McMahon, M. J.....Green Isle
McManamy, E. P.....Rochester
McNevin, C. F.....St. Paul
McNutt, J. R.....Duluth
McPheeters, H. O.....Minneapolis
†McQuarrie, Irvine.....Minneapolis
Mead, C. H.....Duluth
Mead, F. B.....Rochester
Meade, J. R.....St. Paul
Mears, B. J.....St. Paul
Mears, R. F.....Northfield
Medelman, J. P.....St. Paul
Meinert, A. E.....Winona
Meland, E. L.....Minneapolis
Melby, Bendik.....Blooming Prairie
Mellby, O. F.....Thief River Falls
Melzer, G. R.....Lyle
Mercil, W. F.....Crookston
Merkert, C. E.....Minneapolis
Merkert, G. L.....Minneapolis
†Merrill, Elisabeth.....Minneapolis
Merrill, Robert.....Morris
Merriman, L. L.....Duluth
Merritt, W. A.....Rochester
Mesker, G. H.....Olivia
Meyer, A. A.....Melrose
Meyer, E. L.....Minneapolis
Meyer, F. C.....Kenyon
Meyer, J. O.....Grand Rapids
Meyer, P. F.....Faribault
Meyerding, E. A.....St. Paul
Meyerding, H. W.....Rochester
Michael, J. C.....Minneapolis
Michel, H. H.....Minneapolis
Michelson, H. E.....Minneapolis
Mickelson, J. C.....Mankato
Miller, E. W.....St. Peter
Miller, H. A.....Fairmont
Miller, H. E.....Minneapolis
Miller, Hugo E.....Minneapolis
Miller, J. C.....Minneapolis
Miller, J. R., Jr.....Rochester
Miller, V. I.....Mankato
Miller, W. A.....New York Mills
Mills, J. L.....Winnebago
Milton, J. S.....Minneapolis
Minge, R. K.....Clarkfield
Mingo, F. E.....Hugo
Minsky, A. A.....Minneapolis
Minty, Earl W.....Duluth
Mitby, I. L.....Aitkin
Mitchell, E. C.....Minneapolis
Mitchell, R. S.....Grand Meadow
Moberg, C. W.....Detroit Lakes
Moe, J. H.....Minneapolis
Moe, R. J.....Duluth
Moe, Thomas.....Moose Lake
Moen, J. K., Jr.....Minneapolis
Moersch, F. P.....Rochester
Moersch, H. J.....Rochester
Moga, J. A.....St. Paul
Moir, W. W.....Minneapolis
Molander, H. A.....St. Paul
Mollers, T. P.....Mountain Iron
Monahan, R. H.....International Falls
Monroe, P. B.....Two Harbors
Monserud, N. O.....Cloquet
Monson, E. M.....Minneapolis
Monson, L. J.....Canby
Montgomery, Hamilton.....Rochester
Mooney, L. P.....Graceville
Moos, D. J.....Minneapolis
Moquin, Marie A.....St. Paul
More, C. W.....Eveleth
Morehead, D. E.....Owatonna
Moren, Edward.....Minneapolis
Moren, L. A.....St. Paul
Morgan, H. O.....Amboy
Moriarty, Berenice.....St. Paul
Moriarty, Cecile R.....St. Paul
Morissette, Leopold.....Rochester
Mork, B. O., Jr.....Worthington
Mork, B. O., Sr.....Worthington
Mork, F. E.....Anoka
Morley, G. A.....Crookston
Morlock, C. G.....Rochester
Morrison, A. W.....Minneapolis
Morrison, Charlotte J.....Minneapolis
†Morrissey, F. B.....St. Paul
Morrow, J. J.....Austin
Morse, M. P.....Le Roy
Morse, R. W.....Minneapolis
Morsman, L. W.....Hibbing
Mortensbak, H. E.....Hanska
Mosby, M. E.....Long Prairie
Moses, Joseph, Jr.....Northfield
Moss, M. N.....St. Paul
Mountain, G. E.....Rochester
Mouritsen, G. J.....Fergus Falls
Mousel, L. H.....Rochester
Movius, A. J., Jr.....Rochester
Moyer, R. E.....Faribault
Mueller, R. F.....Two Harbors
Mueller, Selma C.....Duluth
Muir, W. F.....Graceville
Muller, R. T.....St. Paul
Mulligan, A. M.....Camp Hulen, Tex.
Mulmed, E. I.....Rochester
Murphy, E. P.....Minneapolis
Murphy, I. J.....Minneapolis
Murray, R. A.....Aitkin
Musachio, N. F.....Foley
Mussey, R. D.....Rochester
Myers, J. A.....Minneapolis
Myers, Thomas.....St. Paul
Myre, C. R.....Paynesville

Naegeli, A. E.....St. Paul
Naegeli, Frank.....Fergus Falls
Nagel, H. D.....Waconia
Naslund, A. W.....Minneapolis
Nass, H. A.....Mabel
Neale, R. M.....Rochester
Nealy, D. E.....Adrian
Neary, R. P.....Minneapolis
Neel, H. B.....Albert Lea
Neff, W. S.....Virginia
Nehring, J. P.....Preston
Nelson, E. H.....Chisholm
Nelson, E. J.....Owatonna
Nelson, E. N.....Lake Park
Nelson, H. E.....Crookston
†Nelson, H. S.....Excelsior
Nelson, K. L.....Anoka
Nelson, L. A.....St. Paul
Nelson, M. S.....Granite Falls
Nelson, N. H.....Minneapolis
Nelson, N. P.....Brainerd
Nelson, O. L. N.....Minneapolis
Nelson, R. L.....Duluth
Nelson, W. I.....Minneapolis
Nelson, W. O. B.....Fergus Falls
Nesbitt, Samuel.....Rochester
Nessa, C. B.....St. Cloud
Neumann, C. A.....Winona
New, G. B.....Rochester
Newhart, Horace.....Minneapolis
Nichols, A. E.....St. Paul
Nichols, D. R.....Rochester
Nicholson, M. A.....Duluth
Nickel, W. R.....Rochester
Nielsen, A. M.....Northfield
Nilson, H. J.....North Mankato
Ninneman, N. N.....Silver Lake
Nissen, A. S.....St. Peter
Noble, J. F.....St. Paul
Noble, J. L.....St. Paul
Noonan, W. J..Ft. Leonard Wood, Mo.
Nordholm, V. W.....Ellsworth, Wis.
Nordin, G. T.....Minneapolis
Nordland, Martin.....Minneapolis
Nordman, W. F.....Mora
Norman, J. F.....Crookston
Norris, N. T.....Caledonia
Noth, H. W.....Minneapolis
Novak, E. E.....New Prague
Nuebel, C. J.....St. Paul
Nuessle, W. G.....Springfield
Nuetzman, A. W.....Faribault
Nutting, R. E.....Duluth
Nydahl, M. J.....St. Paul
Nye, Katherine A.....St. Paul
Nye, Lillian L.....St. Paul
Nygren, W. T.....Braham
Nylander, E. G.....Minneapolis
Nystrom, Ruth G.....Minneapolis

Oberg, C. M.....Minneapolis
O'Brien, J. P.....Rochester
†O'Brien, W. A.....Minneapolis
Ochsner, C. G.....Wabasha
O'Connor, D. C.....Eden Valley
O'Connor, L. J.....St. Paul
Odel, H. M.....Rochester
O'Donnell, D. M.....Ortonville
O'Donnell, J. E.....Minneapolis
Oeljen, S. C. G.....Waseca
Oerting, Harry.....St. Paul
Ogden, Warner.....St. Paul
Ohage, Justus, Jr.....St. Paul
Ohnstad, J. L.....McIntosh
Olds, G. H.....Waseca
O'Leary, J. H.....Staples
O'Leary, P. A.....Rochester
Oliver, C. I.....Graceville
Oliver, I. L.....Graceville
Olmanson, E. G.....St. Peter
Olsen, A. M.....Rochester
Olsen, E. G.....Minneapolis
Olson, A. C.....Minneapolis
Olson, A. E.....Duluth
Olson, A. O.....Duluth

*Deceased
†Affiliate or Associate

Olson, C. A. ..... St. Paul
Olson, C. J. ..... Belle Plaine
Olson, D. C. ..... Gaylord
Olson, E. A. ..... Pine Island
Olson, F. A. ..... Minneapolis
Olson, G. E. ..... West Concord
Olson, L. M. ..... Chisago City
Olson, O. A. ..... Minneapolis
Olson, R. G. ..... Minneapolis
Olson, S. W. ..... Rochester
Onsgard, L. K. ..... Houston
Oppegaard, C. L. ..... Crookston
Oppegaard, M. O. ..... Crookston
Oppen, E. G. ..... Minneapolis
O'Reilley, B. E. ..... St. Paul
Ormond, D. T. ..... Waconia
Ostergren, E. W. ..... St. Paul
Ostergren, Eva-Jane ..... St. Paul
Otto, H. C. ..... Frazee
Ouellette, A. J. ..... St. Paul
Owre, Oscar ..... Minneapolis

*Page, C. V. ..... St. Paul
Page, R. L. ..... St. Charles
Paine, J. R. ..... Minneapolis
Palmer, C. F. ..... Albert Lea
Palmer, H. A. ..... Blackduck
Palmer, W. L. ..... Albert Lea
Palmerton, E. S. ..... Albert Lea
Pankratz, P. J. ..... Mountain Lake
Paradis, W. G. ..... Crookston
Parker, O. W. ..... Ely
Parker, R. L. ..... Rochester
Parker, W. H. ..... Chisholm
Parkhill, Edith M. ..... Rochester
Parson, E. I. ..... Askov
Parson, L. R. ..... Elbow Lake
Parson, Lillian B. ..... Elbow Lake
Parsons, J. G. ..... Crookston
Parsons, R. L. ..... Monterey
Pasek, A. W. ..... Cloquet
Passer, A. A. ..... Olivia
Pastore, P. N. ..... Rochester
Patch, O. B. ..... Duluth
Patterson, W. E. ..... Minneapolis
Patterson, W. L. ..... Fergus Falls
Pattison, D. H. ..... Rochester
Paulson, E. C. ..... Dalton
Paulson, D. L. ..... Rochester
Paulson, J. A. ..... Rochester
Paulson, T. S. ..... Fergus Falls
Pearsall, R. P. ..... Virginia
Pearson, C. C. ..... Rochester
Pearson, B. F. ..... Shakopee
Pearson, F. R. ..... St. Paul
Pearson, M. M. ..... St. Paul
Peck, L. D. ..... Hastings
Peck, L. R. ..... Hastings
Pedersen, R. C. ..... Duluth
Pederson, A. H. ..... St. Paul
Pederson, R. M. ..... Minneapolis
Pelant, F. J. ..... New Ulm
Pemberton, J. deJ. ..... Rochester
Pender, J. W. ..... Rochester
Penhall, F. W. ..... Morton
Penn, G. E. ..... Mankato
Pennie, D. F. ..... Duluth
Pennington, R. E. ..... Rochester
Pennington, Reuben ..... Minneapolis
Peppard, T. A. ..... Minneapolis
Perry, C. G. ..... St. Paul
Pertl, A. L. ..... Canby
Peters, G. A. ..... Rochester
Petersen, J. R. ..... Minneapolis
Petersen, M. C. ..... Willmar
Petersen, P. C. ..... Braham
Petersen, Thorvald ..... Minneapolis
Peterson, A. A. ..... Mora
Peterson, D. B. ..... St. Paul
Peterson, E. N. ..... Virginia
Peterson, H. O. ..... St. Paul
Peterson, H. W. ..... Minneapolis
Peterson, J. H. ..... Duluth
Peterson, J. L. E. ..... St. Paul
Peterson, N. P. ..... Minneapolis
Peterson, O. H. ..... Minneapolis
Peterson, O. L. ..... Cokato
Peterson, P. E. ..... Minneapolis
Peterson, R. A. ..... Vesta
Peterson, V. N. ..... St. Paul
Peterson, W. C. ..... Minneapolis
Peterson, W. G. ..... Rochester
Peterson, W. H. ..... Minneapolis
Petit, L. J. ..... Minneapolis
Petraborg, H. T. ..... Aitkin
Pewters, J. T. ..... Minneapolis
Peyton, W. T. ..... Minneapolis
Pfuetze, K. H. ..... Cannon Falls
Pfunder, M. C. ..... Minneapolis

Phalen, G. S. ..... Rochester
Phelps, K. A. ..... Minneapolis
Phillips, A. E. ..... Delano
Phillips, W. H. ..... Jordan
Pierce, C. H. ..... Wadena
Pierson, R. F. ..... Slayton
Piper, M. C. ..... Rochester
Piper, W. A. ..... Mountain Lake
Platou, E. S. ..... Minneapolis
Plimpton, N. C., Jr. ..... Rochester
Plondke, F. J. ..... St. Paul
*Plonske, C. J. ..... Faribault
Plowman, E. T. ..... Marble
Plummer, W. A. ..... Rochester
Pogue, R. E. ..... Watertown
Pohl, J. F. ..... Minneapolis
Poirier, J. A. ..... Forest Lake
Pollard, D. W. ..... Minneapolis
Pollock, D. K. ..... Minneapolis
Pollock, L. W. ..... Rochester
Polmeteer, F. E. ..... Rochester
Polzak, J. A. ..... Minneapolis
Pool, T. L. ..... Rochester
Popp, W. C. ..... Rochester
Poppe, F. H. ..... Minneapolis
Potek, David ..... International Falls
Potter, R. B. ..... Minneapolis
Potthoff, C. J. ..... Minneapolis
Power, J. E. ..... Duluth
Powers, F. H. ..... Rochester
Prangen, A. D. ..... Rochester
Pratt, F. J. ..... Minneapolis
Pratt, J. A. ..... Minneapolis
Pratt, J. H., Jr. ..... Rochester
Preine, I. A. ..... Minneapolis
Preisinger, J. W. ..... Renville
Prendergast, H. J. ..... St. Paul
Prendergast, J. J. ..... St. Cloud
Prickman, L. E. ..... Rochester
Priestley, J. T. ..... Rochester
Prim, J. A. ..... Minneapolis
Prins, L. R. ..... Albert Lea
Proeschel, R. K. ..... Willmar
Proshek, C. E. ..... Minneapolis
Pruitt, R. D. ..... Rochester
Prunty, F. C. ..... Rochester
Pugh, D. G. ..... Rochester
Purves, G. H. ..... Lake Benton
Puumala, R. H. ..... Cloquet

Quanstrom, V. E. ..... Brainerd
Quello, R. O. B. ..... Minneapolis
Quick, E. D. ..... Riverside, Calif.
†Quinby, T. F. ..... Minneapolis
Quist, H. W. ..... Minneapolis

Raadquist, C. S. ..... Hibbing
Radabaugh, R. C. ..... Hastings
Raetz, S. J. ..... Maple Lake
Raiter, F. W. S. ..... Cloquet
Raiter, R. F. ..... Cloquet
†Ramsey, W. R. ..... St. Paul
Randall, A. M. ..... Ashby
Randall, K. C., II ..... Lafayette, Ind.
Randall, L. M. ..... Rochester
Ransom, M. L. ..... Hancock
Rasmussen, R. C. ..... Minneapolis
Rasmussen, W. C. ..... Rochester
Raszkowski, H. J. ..... Rochester
†Ratcliffe, J. J. ..... Aitkin
Rathbun, C. A. ..... St. Cloud
Raymond, J. H. ..... Canby
Rea, C. E. ..... St. Paul
Redding, M. D. ..... Rochester
Reed, C. A. ..... Minneapolis
Reeser, Richard, Jr. ..... Rochester
Reeve, E. A. T. ..... Elbow Lake
Reff, A. R. ..... Crookston
Regnier, E. A. ..... Minneapolis
Rein, G. N. ..... Benton Harbor, Mich.
Reineke, G. F. ..... New Ulm
†Reiter, H. W. ..... Shakopee
Replogle, W. H. ..... Wabasha
Rewbridge, A. G. ..... Minneapolis
Reynolds, J. S. ..... Minneapolis
Rice, C. O. ..... Minneapolis
Rice, H. G. ..... Moorhead
Rice, H. R. ..... Roseau
Richards, E. T. F. ..... St. Paul
Richards, W. B. ..... St. Cloud
Richardson, F. S. ..... Minneapolis
Richardson, H. E. ..... St. Paul
Richardson, R. J. ..... Rushford
Richardson, W. E. ..... Rushford
Richdorf, L. F. ..... Minneapolis
Rick, P. F. W. ..... St. Paul
Ridgway, A. M. ..... Annandale
Rieke, W. W. ..... Wayzata
Rigler, L. G. ..... Minneapolis
Rigos, F. J. ..... Rochester
Rimer, E. W. ..... Breckenridge
Ringle, O. F. ..... Walker

Risch, R. E. ..... Minneapolis
*Rishmiller, J. H. ..... Minneapolis
Risser, A. F. ..... Stewartville
Risser, E. D. ..... Winona
Ritchie, H. P. ..... St. Paul
Ritchie, W. P. ..... St. Paul
Ritt, A. E. ..... St. Paul
Rivers, A. B. ..... Rochester
Rizer, R. I. ..... Minneapolis
Roan, C. M. ..... Minneapolis
Robb, E. F. ..... Minneapolis
Robbins, C. P. ..... Winona
Robbins, O. F. ..... Minneapolis
Roberts, L. J. ..... Minneapolis
†Roberts, L. M. ..... Little Falls
Roberts, O. W. ..... Owatonna
Roberts, S. W. ..... Minneapolis
Roberts, T. S. ..... Minneapolis
Roberts, W. B. ..... Minneapolis
Robertson, H. E. ..... Rochester
†Robertson, J. B. ..... Minneapolis
Robertson, P. A. ..... Austin
Robilliard, C. M. ..... Faribault
Robinson, F. J. ..... Rochester
†Robinson, J. M. ..... Corning, N. Y.
Robitshek, E. C. ..... Minneapolis
Rochford, W. E. ..... Minneapolis
Rodda, F. C. ..... Minneapolis
Roehlke, A. B. ..... Elk River
Roemer, H. J. ..... Winona
Rogers, A. M. ..... Rochester
Rogers, C. W. ..... Heron Lake
Rogers, S. F. ..... St. Paul
Rogne, W. G. ..... Spring Grove
Roholt, C. L. ..... Waverly
Rohrer, C. A. ..... Waterville
Rokala, H. E. ..... Biwabik
Rolig, D. H. ..... Howard Lake
Rood, D. C. ..... Duluth
Root, G. T. ..... Rochester
Rose, J. T. ..... Lakefield
Rosen, Samuel ..... Minneapolis
Rosenbaum, E. E. ..... Rochester
Rosenberg, E. F. ..... Rochester
Rosenbladt, Louis ..... St. Paul
Rosenfield, A. B. ..... Hibbing
Rosenholtz, B. I. ..... St. Paul
Rosenow, E. C. ..... Rochester
Rosenthal, F. H. ..... Grand Meadow
Rosenthal, Robert ..... St. Paul
Rosenwald, R. M. ..... Minneapolis
Roskilly, G. C. P. ..... Minneapolis
Ross, A. J. ..... Minneapolis
Rossen, R. X. ..... Hastings
Roth, F. D. ..... Lewiston
†Rothrock, J. L. ..... St. Paul
Rothschild, H. J. ..... St. Paul
Roust, H. A. ..... Montevideo
Rowe, O. W. ..... Duluth
Rowe, W. H. ..... Fairmont
Rowles, E. K. ..... Coleraine
*Roy, J. A. ..... Red Lake Falls
Roy, P. C. ..... St. Paul
Rucker, C. W. ..... Rochester
Rucker, W. H. ..... Minneapolis
Rud, N. E. ..... Minneapolis
Rudell, G. L. ..... Minneapolis
Rudie, P. S. ..... Duluth
Ruggles, G. McC. ..... Forest Lake
Ruhberg, G. N. ..... St. Paul
Rumpf, C. W. ..... Faribault
Rumpf, W. H., Jr. ..... St. Cloud
†Rumpf, W. H. ..... Faribault
Russ, H. H. ..... Blue Earth
Russeth, A. N. ..... Minneapolis
Rusten, E. M. ..... Minneapolis
Rutherford, W. C. ..... St. Paul
Rutledge, D. I. ..... Rochester
Rutledge, L. H. ..... Detroit Lakes
Ryan, J. J. ..... St. Paul
Ryan, J. M. ..... St. Paul
Ryan, M. E. ..... St. Paul
Ryan, W. J. ..... Duluth
Rynearson, E. H. ..... Rochester

Sach-Rowitz, Alvan ..... Moose Lake
Sadler, W. P., Jr. ..... Minneapolis
Saffert, C. A. ..... New Ulm
Sahr, W. G. ..... Hutchinson
St. Cyr, K. J. ..... Osseo
Salt, C. G. ..... Minneapolis
Salter, R. A. ..... Virginia
Samson, E. R. ..... Stillwater
Samuelson, Samuel ..... Minneapolis
Sandell, S. T. ..... Oak Terrace
Sanderson, A. G. ..... Granite Falls
Sandt, K. E. ..... Minneapolis
Sandven, N. O. ..... Paynesville
Sanford, A. H. ..... Rochester
Sarff, O. E. ..... Virginia
Sarnecki, M. M. ..... St. Paul
Satersmoen, Theodore .. Pelican Rapids

*Deceased
†Affiliate or Associate

Sather, Allen ..... Fosston
Sather, E. R. ..... Alexandria
Sather, G. A. ..... Fosston
Sather, R. N. ..... McIntosh
Sather, R. O. ..... Crookston
Satterlee, H. W. ..... Lewiston
Satterlund, V. L. ..... St. Paul
Savage, F. J. ..... St. Paul
Sawatzky, W. A. ..... Minneapolis
Sax, S. G. ..... Duluth
Sayre, G. P. ..... Rochester
Schaaf, F. H. K. ..... Minneapolis
Schade, F. L. ..... Worthington
Schaefer, J. F. ..... Owatonna
Schaefer, Samuel ..... Winona
Schaefer, W. G. ..... Minneapolis
Schamber, W. F. ..... Parkers Prairie
Schatz, F. J. ..... St. Cloud
Scheifley, C. H. ..... Rochester
†Scheldrup, N. H. ..... Minneapolis
Scherer, C. A. ..... Duluth
Scherer, L. R. ..... Minneapolis
Schiele, B. C. ..... Minneapolis
Schimelpfenig, G. T. ..... Chaska
Schleinitz, F. B. ..... Battle Lake
Schlesselman, G. H. ..... Anoka
Schlesselman, J. T. ..... Mankato
Schlicke, C. P. ..... Rochester
Schmidt, G. F. ..Camp Claiborne, La.
Schmidt, H. W. ..... Rochester
Schmidt, P. A. ..... Good Thunder
Schmidt, P. G., Jr. ..... Granite Falls
Schmidt, W. R. ..... Glencoe
Schmidt, W. R. ..... Worthington
†Schmidt, A. F. ..... Minneapolis
Schmitt, G. F., Jr. ..... Rochester
†Schmitt, S. C. ..Los Angeles, Calif.
Schneider, H. H. ..... Fresno, Calif.
†Schneider, J. P. ..... Minneapolis
Schneider, P. J. ..... Adams
Schneidman, N. R. ..... Minneapolis
Schoch, R. B. J. ..... St. Paul
Scholpp, O. W. ..... Hutchinson
Schons, Edward ..... St. Paul
Schottler, G. J. ..... Dexter
Schottler, M. E. ..... Minneapolis
Schroder, C. H. ..... Duluth
Schroeppel, J. E. ..... Winthrop
Schuldt, F. C. ..... St. Paul
Schulte, T. L. ..San Francisco, Calif.
Schultz, J. A. ..... Albert Lea
Schultz, P. J. ..... Minneapolis
Schulze, A. G. ..... St. Paul
Schunke, G. B. ..... Rochester
†Schussler, O. F. ..... Minneapolis
Schutz, E. S. ..... Mountain Lake
Schwartz, E. R. ..... Stewartville
Schwartz, V. J. ..... Minneapolis
Schweiger, L. R. ..... Rochester
Schweiger, T. R. ..... Hibbing
Schwyzer, Arnold ..... St. Paul
†Schwyzer, Gustav ..... Minneapolis
Scofield, C. L. ..... Benson
Scott, E. E. ..... St. Paul
†Scott, F. H. ..... Minneapolis
Scott, H. G. ..... Minneapolis
Sealy, W. B. ..... Rochester
Seashore, Gilbert ..... Minneapolis
Seashore, R. T. ..... Duluth
Seham, Max ..... Minneapolis
Seifert, M. H. ..... Excelsior
Seifert, O. J. ..... New Ulm
Seitz, S. B. ..... Barnesville
Seldon, T. H. ..... Rochester
Seljeskog, S. R. ..... Minneapolis
Sellers, G. K. ..... Dassel
Selleseth, I. F. ..... Minneapolis
†Senkler, G. E. ..... St. Paul
Senn, E. W. ..... Owatonna
Serkland, J. C. ..... Rothsay
Sessions, J. C. ..... Minneapolis
Sether, A. F. ..... Ruthton
Settlage, A. F. E. ..... Worthington
Setzer, H. J. ..... St. Paul
Shaleen, A. W. ..... Hallock
Shannon, S. S. ..... Ironton
Shaperman, Eva P. ..... Minneapolis
Shapiro, E. Z. ..... Duluth
Shapiro, M. J. ..... Minneapolis
Sharp, D. V. ..... Minneapolis
Sharpe, W. S. ..... Rochester
Shastid, T. H. ..... Duluth
Shaw, A. W. ..... Virginia
Shedlov, Abraham ..... Fosston
Sheedy, C. L. ..... Austin
Shelden, W. D. ..... Rochester
Shellman, J. L. ..... St. Paul
Shephard, V. D. ..... Rochester
Sheppard, C. G. ..... Hutchinson
†Sheppard, Fred ..... Hutchinson
†Sheppard, P. E. ..... Hutchinson
Sher, D. A. ..... Minneapolis
Sherman, C. H. ..... Stillwater
Sherman, C. L. ..... Luverne
Sherman, R. V. ..... Red Wing
Sherwood, G. E. ..... Kimball
Shick, R. M. ..... Rochester
Shillington, M. A. ..... Glendive, Mont.
Shima, G. J. ..... Sleepy Eye
Shimonek, S. W. ..... St. Paul
Short, Jacob ..... St. Paul
†Shrader, J. S. ..... Springfield
Siegel, J. S. ..... Virginia
Siegmann, W. C. ..... Minneapolis
Silver, J. D. ..... Minneapolis
Simison, Carl ..... Barnesville
Simison, C. W. ..... Hawley
Simons, B. H. ..... Chaska
Simons, E. J. ..... Swanville
Simons, J. H. ..... Minneapolis
Simons, L. T. ..... St. Paul
Simons, S. J. ..... Akeley
Simonson, D. B. ..... Minneapolis
Simonton, K. M. ..... Rochester.
Simpson, E. D. ..... Minneapolis
Sinamark, Andrew ..... Hibbing
Singer, B. J. ..... St. Paul
Sinykin, M. B. ..... Minneapolis
Siperstein, D. M. ..... Minneapolis
Sisler, C. E. ..... Grand Rapids
†Sivertsen, Andrew ....Tarzana, Calif.
Sivertsen, Ivar ..... Minneapolis
Sjostrom, L. E. ..... Storden
Skaug, H. M. ..... Chatfield
Skinner, H. O. ..... St. Paul
Skjold, A. C. ..... Minneapolis
Slater, S. A. ..... Worthington
Sloan, Julius ..... Minneapolis
Slocumb, C. H. ..... Rochester
†Slocumb, J. A. ..... Plainview
Sluder, F. S., Jr. ..... Rochester
*Slyfield, F. F. ..... Duluth
Smedal, H. A., Jr. ..... Rochester
Smisek, E. A. ..... St. Paul
Smisek, F. M. E. ..... Minneapolis
Smith, A. E. ..... Minneapolis
Smith, Archie M. ..... Minneapolis
Smith, A. M. ..... Minneapolis
Smith, B. A. ..... Crosby
Smith, B. F. ..... Rochester
Smith, C. M. ..... Duluth
Smith, F. A. ..... Rochester
Smith, F. D. ..... Rochester
Smith, F. L. ..... Rochester
Smith, G. G. ..... Fulda
Smith, H. L. ..... Rochester
Smith, H. R. ..... Minneapolis
Smith, L. A. ..... Balaton
Smith, L. A. ..... Rochester
Smith, L. G. ..... Montevideo
Smith, Margaret I. ..... Minneapolis
Smith, M. W. ..... Red Wing
Smith, N. D. ..... Rochester
Smith, N. M. ..... Minneapolis
Smith, R. L., Jr. ..... Rochester
Smith, S. J. ..... Eveleth
Smith, V. D. E. ..... St. Paul
Smith, W. R. ..... Grand Marais
Snell, A. M. ..... Rochester
Snyder, G. W. ..... St. Paul
Snyder, J. M. ..... Denver, Colo.
Snyker, O. E. ..... Ely
Soderlind, R. T. ..... Minneapolis
Sogge, L. L. ..... Windom
Sohlberg, O. I. ..... St. Paul
Sohmer, A. E. ..... Mankato
Solhaug, S. B. ..... Minneapolis
Solsem, F. N. ..... Spicer
Sommer, A. W. ..... Elmore
Soniat, T. L. L. ..... New Orleans, La.
Sonnesyn, N. N. ..... Le Sueur
Sorum, F. T. ..... Jasper
Souster, B. B. ..... St. Paul
Spang, A. J. ..... Duluth
Spang, J. S. ..... Duluth
Spano, J. P. ..... Minneapolis
Sperling, Louis ..... Minneapolis
Spink, W. W. ..... Minneapolis
Spittler, R. O. ..... New Richland
Sprafka, J. M. ..... St. Paul
Sprague, R. G. ..... Rochester
Spratt, C. N. ..... Minneapolis
Spurbeck, R. G. ..... Cloquet
Spurzem, R. J. ..... Anoka
Stafford, C. E. ..... Baudette
Stafford, D. E. ..... Rochester
Standard, W. P. ..... Rochester
Stanford, C. E. ..... Minneapolis
Stangl, P. E. ..... St. Cloud
Stanley, C. R. ..... Worthington
Stebbins, T. L. ..... Minneapolis
Steffens, L. A. ..... Red Wing
Stein, R. J. ..... Pierz
Stein, K. E. ..... Lakeville
Steinberg, C. L. ..... St. Paul
Steiner, I. W. ..... Winona
Stelter, L. A. ..... Minneapolis
Stemsrud, H. L. ..... Parkers Prairie
Stenstrom, Annette E. T. ..Minneapolis
Stephan, E. L. ..... Hinckley
Sterner, E. G. ..... St. Paul
Sterner, E. R. ..... St. Paul
Sterner, O. W. ..... St. Paul
Stevens, John ..... Gonvick
Stevenson, B. M. ..... Fulda
Stevenson, F. W. ..... Faribault
Stevenson, W. D., Jr. ..... Rochester
Stewart, Alexander ..... St. Paul
Stewart, A. B. ..... Owatonna
Stewart, C. A. ..... Minneapolis
Stewart, D. E. ..... Grand Rapids
Stewart N. E. ..... Northport, N. Y.
Stewart, R. I. ..... Minneapolis
Stickney, J. M. ..... Rochester
Stillwell, W. C. ..... Mankato
Stinnette, S. E. ..... St. Paul
Stocking, F. F. ..... Hallock
Stoesser, A. V. ..... Minneapolis
Stolpestad, A. H. ..... St. Paul
Stolpestad, H. L. ..... St. Paul
†Stomel, Joseph ..Los Angeles, Calif.
Stover, Lee ..... Rochester
Strachauer, A. C. ..... Minneapolis
Strand, E. V. ..... Bayport
Stransky, T. W. ..... Owatonna
Strate, G. E. ..... St. Paul
Strathern, C. S. ..... St. Peter
Strathern, F. P. ..... St. Peter
Strathern, M. L. ..... Gilbert
Stratte, H. C. ..... Windom
Straus, M. L. ..... St. Paul
Street, Bernard ..... St. Cloud
Strobel, W. G. ..... Duluth
Stroebel, C. F., Jr. ..... Rochester
Strom, G. W. ..... Rochester
Stromgren, D. T. ..... Minneapolis
Strout, G. E. ..... Minneapolis
Stuart, A. B. ..... Cloquet
Stuhler, L. G. ..... Rochester
Stuhr, J. W. ..... Stillwater
Sturre, J. R. ..... Minneapolis
Stuurmans, S. H. ..... Erskine
*Sukeforth, L. A. ..... Duluth
Sullivan, R. M. ..... Minneapolis
Sullivan, R. R. ..... Minneapolis
Sundt, Mathias ..... Minneapolis
Sutherland, C. G. ..... Rochester
Sutherland, H. N. ..... Ely
Sutton, C. S. ..... St. Cloud
Sutton, H. R. ..... Hoffman
Swanson, Cephas ..... Minneapolis
Swanson, J. A. ..... St. Paul
Swanson, P. E. ..... Virginia
Swanson, R. E. ..... Minneapolis
Swanson, R. R. ..... Albert Lea
Swedburg, W. A. ..... Duluth
Swedenburg, P. A. ..... Swanville
Sweetser, H. B., Jr. ..... Minneapolis
†Sweetser, H. B., Sr. ..... Minneapolis
Sweetser, T. H. ..... Minneapolis
Sweitzer, S. E. ..... Minneapolis
Swendseen, C. G. ..... Minneapolis
Swendson, J. J. ..... St. Paul
Swensen, R. G. ..... North Branch
Swenson, A. O. ..... Duluth
Swenson, O. J. ..... Waseca
Swezey, B. F. ..... Bellingham
Sybilrud, H. W. ..... Bricelyn

Tanquist, E. J. ..... Alexandria
Taylor, C. W. ..... Duluth
Taylor, J. H. ..... Minneapolis
Teisberg, C. B. ..... St. Paul
Teisberg, J. E. ..... Middle River
Telford, V. J. ..... Litchfield
Tenner, R. J. ..... Rochester
Tennison, W. J. ..... Rochester
Terrell, B. J. ..... Nopeming
Tesch, G. H. ..... Elk River
Thabes, J. A. ..... Brainerd
Thabes, J. A., Jr. ..... Brainerd
Thayer, E. A. ..... Truman
Thielen, R. D. ..... St. Michael
Thomas, G. E. ..... Minneapolis
Thomas, G. H. ..... Minneapolis
Thomas, G. J. ..... Minneapolis
Thompson, Albert ..... St. James
Thompson, Arthur ..... Cokato
Thompson, C. O. ..... Hendricks
Thompson, F. A. ..... St. Paul
Thompson, G. J. ..... Rochester
Thomson, J. M. ..... Brownsdale
Thoreson, M. O. ..... South St. Paul

*Deceased
†Affiliate or Associate

Thorson, E. O.....Luverne
Thysell, D. M.....Minneapolis
Thysell, F. A.....Moorhead
Thysell, V. D.....Hawley
Tibbetts, M. H.....Duluth
Tierney, C. M.....Harmony
Tifft, C. R.....St. Paul
Tilderquist, D. L.....Duluth
Tillisch, J. H.....Rochester
†Tinker, C. W.....Stewart
Tingdale, A. C.....Minneapolis
Tingdale, Carlyle.....Hibbing
Tischer, E. P.....Rochester
Tofte, Josephine B.....Minneapolis
Torgerson, W. B.....Oklee
Townsend, De Wayne.....Brooten
Traeger, C. A.....Faribault
Trandem, C. Elinor.....Rochester
Traxler, J. F.....Henderson
Tregilgas, H. R.....So. St. Paul
Trommald, Gladys B. K.
Northville, Mich.
Troost, H. B.....Mankato
Trueman, H. S.....Minneapolis
Trutna, T. J.....Silver Lake
Trytten, E. G.....Middle River
Tunstead, H. J.....Minneapolis
Tuohy, E. B.....Rochester
Tuohy, E. L.....Duluth
Turnacliff, D. D.....Minneapolis
Tweedy, G. J.....Winona
Tweedy, J. A.....Winona
Tweedy, R. B.....Winona
Twyman, R. A.....Rochester
*Tyrrell, C. C.....Minneapolis

Ude, W. H.....Minneapolis
Uhley, C. G.....Crookston
Uihlein, Alfred.....Rochester
Ulrich, H. L.....Minneapolis
Undine, C. A.....Minneapolis
Urberg, S. E.....Duluth

Vaaler, Torvald.....Cannon Falls
Vadheim, A. L.....Tyler
Vadheim, J. L.....Rochester
Vail, J. B.....San Diego, Calif.
Valentine, W. H.....Tracy
Van Demark, R. E.....Rochester
Vandersluis, C. W.....Bemidji
*Van Slyke, C. A.....St. Paul
Van Valkenberg, J. D.....Floodwood
Vaughan, V. M.....Truman
Vaughn, L. D.....Rochester
Veirs, D. M.....St. Paul
Veirs, Ruby J. S.....St. Paul
Venables, A. E.....St. Paul
Vercellini, C. H. E.....Duluth
Vezina, J. C.....Mapleton
Vik, A. E.....Minneapolis
Vik, Melvin.....Onamia
Virnig, M. P.....Wells
Vogel, H. A. L.....New Ulm
Vogel, J. H.....New Ulm
Von der Weyer, W. H.....St. Paul

Waas, C. W.....St. Paul
Wadd, C. T.....Janesville
Wagener, H. P.....Rochester
Wahlberg, E. W.....Sleepy Eye
Wahlquist, H. F.....Minneapolis
Wakefield, E. G.....Rochester
Walch, A. E.....Minneapolis
Waldron, C. W.....Minneapolis
Walfred, K. A.....St. Cloud
†Walker, A. E.....Duluth
Walker, A. E.....St. Paul
Walker, G. H.....Winona
Wall, C. R.....Minneapolis
Wallace, M. O.....Duluth
Waller, J. D.....Wilmont
Walsh, M. N.....Rochester

*Deceased
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Walsh, W. T.....Minneapolis
Walter, C. W.....St. Paul
Walters, Waltman.....Rochester
Wangensteen, O. H.....Minneapolis
Wanous, E. Z.....Minneapolis
Ward, A. W.....Minneapolis
Ward, P. A.....Minneapolis
*Warham, T. T.....Minneapolis
Warner, J. J.....Perham
Warnock, R. W.....St. Paul
Warren, C. A.....St. Paul
*Warren, E. L.....St. Paul
Warren, F. S.....Washington, D. C.
Wasson, L. F.....Alexandria
Watkins, C. H.....Rochester
Watson, A. M.....Royalton
Watson, C. G.....Soudan
Watson, C. J.....Minneapolis
Watson, P. T.....Cass Lake
Watson, S. W.....Royalton
Watson, W. J.....Holdingford
Watz, C. E.....St. Paul
Waugh, J. M.....Rochester
Weaver, P. H.....Faribault
Webb, R. C.....Minneapolis
Webber, E. E.....Duluth
Webber, F. L.....St. Paul
Weber, H. M.....Rochester
Webster, L. J.....Battle Lake
Weir, J. F.....Rochester
Weis, B. A.....St. Paul
Weisberg, Maurice .....St. Paul
Weisel, Wilson.....Rochester
Weiser, G. B.....New Ulm
Weisman, S. A.....Minneapolis
Weismann, R. E.....Rochester
Welch, M. C.....St. Paul
Wellman, T. G.....Lake City
Wells, A. H.....Duluth
Wells, W. B.....Jackson
Welton, P. C.....Richfield, Utah
Wenner, W. T.....St. Cloud
Wentworth, A. J.....Mankato
Wenzel, G. P.....St. Paul
Werner, O. S.....Cambridge
West, E. J.....Faribault
Westby, Magnus.....Madison
Westby, Nels.....Madison
†Westerman, A. E.....Montgomery
Westerman, F. C.....Montgomery
Westra, J. J.....Muncie, Ind.
Wethall, A. G.....Minneapolis
Wetherby, Macnider.....Minneapolis
Weum, T. W.....Minneapolis
Wheeler, D. W.....Duluth
Wheeler, M. W.....St. Paul
Whetstone, S. D.....Owatonna
Whitacre, J. C.....St. Paul
White, A. A.....Minneapolis
White, S. M.....Minneapolis
White, W. D.....Minneapolis
Whitesell, L. A.....Minneapolis
Whitmore, F. W.....St. Paul
Whitney, R. A.....Cambridge
Whitson, S. A.....Alden
Whittemore, D. D.....Bemidji
Widen, W. F.....Minneapolis
Wiechman, F. H.....Montgomery
Wiig, L. M.....Rochester
Wilcox, A. E.....Minneapolis
Wilcox, L. E.....Rochester
Wilder, K. W.....Minneapolis
Wilder, R. L.....Minneapolis
Wilder, R. M.....Rochester
Wilken, P. A.....Minneapolis
Wilkinson, Stella L.....Newport
Wilkowske, R. J.....Owatonna
Will, C. B.....Bertha
Will, W. W.....Bertha
Willcutt, C. E.....Minneapolis
Williams, C. A.....Pipestone
Williams, C. K.....St. Paul
Williams, H. L., Jr.....Rochester
Williams, H. O.....Lake Crystal

Williams, L. A.....Slayton
Williams, M. R.....Cannon Falls
Williams, R. D.....Rochester
Williams, R. V.....Rushford
Williams, Robert.....Minneapolis
Williamson, G. A.....St. Paul
Willius, F. A.....Rochester
Willson, D. M.....Rochester
Wilmot, C. A.....Litchfield
Wilmot, H. E.....Litchfield
Wilson, C. E.....Blue Earth
Wilson, I. H.....Worthington
Wilson, J. A.....St. Paul
Wilson, J. V.....St. Paul
Wilson, J. W.....Rochester
Wilson, L. B.....Rochester
Wilson, R. B.....Rochester
Wilson, R. H.....Winona
Wilson, V. O.....Minneapolis
Wilson, W. E.....Northfield
†Wilson, W. F.....Lake City
Wilson, W. H.....Rochester
Wiltrout, I. G.....Oslo
Winer, L. H.....Minneapolis
Wingquist, C. G.....Crosby
Winnick, J. B.....St. Paul
Winter, J. A.....Duluth
Winther, Nora M. C.....Minneapolis
Wipperman, F. F.....Minneapolis
Wise, R. W. E.....Rochester
Witham, C. A.....Minneapolis
Withrow, M. E.....International Falls
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Wohlrabe, C. F.....No. Mankato
Wohlrabe, E. J.....Springfield
Wold, K. C.....St. Paul
Wolff, H. J.....St. Paul
Wolkoff, H. J.....St. Paul
Wollaeger, E. E.....Rochester
Wolner, O. H.....St. Peter
Wolstan, S. D.....Minneota
Woltman, H. W. F.....Rochester
Wood, B. J.....Rochester
Wood, H. G.....Rochester
Wood, W. W., Jr.....Rochester
Woodruff, C. W.....Chatfield
Woodruff, Robert.....Denver, Colo.
Woods, R. M.....Rochester
Woodworth, Elizabeth A.....Minneapolis
Woodworth, L. F.....Le Center
Workman, W. G.....Tracy
Wozencraft, J. P.....Rochester
Wray, W. E.....Campbell
*Wright, C. B.....Minneapolis
†Wright, C. D.....Minneapolis
*Wright, F. R.....Minneapolis
Wright, S. G.....Minneapolis
Wright, W. S.....Minneapolis
Wulf, R. F.....Rochester
Wunder, H. E.....Shakopee
*Wylie, A. R. T.....Faribault
Wynne, H. M. N.....Minneapolis
Wyrens, R. G.....Rochester

Yaeger, W. W.....Marshall
Yeager, C. L.....Rochester
Ylvisaker, R. S.....Minneapolis
Yoerg, O. W.....Minneapolis
Young, H. H.....Rochester
Young, T. O.....Duluth
*Young, V. A.....Duluth
Younger, L. I.....Winona
Youngren, E. R.....St. Paul

Zachman, A. H.....Melrose
Zachman, L. L.....St. Paul
Zaworski, E. A.....Minneapolis
Zeman, E. W.....Hibbing
Zemke, E. E.....Fairmont
Zierold, A. A.....Minneapolis
Zimmermann, H. B.....St. Paul
Ziskin, Thomas.....Minneapolis
Zlatovski, M. L.....Duluth

MINNESOTA STATE MEDICAL ASSOCIATION

88th Annual Session

May 26, 27, and 28, 1941

St. Paul, Minnesota

ANNOUNCEMENTS

Presiding officers at each session have been instructed by the Committee on Scientific Assembly to show a blue light on the speakers' rostrum two minutes before the end of each speaker's program time. A red light will show when his time is up. All meetings are in charge of committee members.

Register and Secure Your Badge at the Registration desk at the Saint Paul Auditorium at 8 a. m. Registration on Sunday, May 25, will be in the lobby of the Hotel Saint Paul.

Telephone Service: Special incoming lines have been installed at the Registration desk. All local and long distance calls will be handled promptly under the direction of Mrs. Nellie Grant Christenson, Physicians Exchange.

Bring Your Membership Card: There will be no registration fee for those who present a membership card or receipt or other evidence from their county society or the state association or the American Medical Association nor for members of associated professions including dentists, pharmacists, interns, nurses, hospital personnel, teachers or social welfare workers who present invitations or other identification.

Badges: You are requested to wear your badge while you are on the convention floor. This is important and will greatly assist us to eliminate undesirable persons such as cranks and pickpockets who so frequently try to take advantage of meetings of this character.

Woman's Auxiliary: Wives of physicians attending the meeting may secure programs of the business and social sessions of the Woman's Auxiliary at the Woman's Registration Desk in the lobby of the Hotel Saint Paul. All visiting women are cordially invited to attend the special events arranged by hostesses of the Ramsey County Medical Auxiliary. Among these is a tea at the University Club, Monday, May 26. Every Auxiliary member is invited to attend the Annual Meeting and luncheon Tuesday, May 27, at the Commodore Hotel, and all out-of-town guests are invited to attend a breakfast as guests of the Ramsey Auxiliary at 10 a. m., Wednesday, May 28, Hotel Saint Paul.

Automobile: Good parking space is available next to the Auditorium.

Luncheons: Twenty Round Table Discussion Luncheons have been arranged for Tuesday and Wednesday, May 27 and 28, at the Hotel Saint Paul. Tickets must be purchased in advance for these luncheons. Lists of subjects and leaders are printed in this program. Attendance at each luncheon is limited to 25 and late comers will be accommodated according to their choice if limits have not already been reached. Tickets 75 cents.

Annual Banquet: The annual dinner for members, guests and their wives will be held at the Hotel Saint Paul, Tuesday evening, May 27, at 6:30 p. m. Col. John R. Hall, M.C., Washington, D. C., Director of the Hospital Division, Surgeon General's Staff, U. S. Army, and B. J. Branton, President of the Minnesota State Medical Association, will be banquet speakers. Tickets $1.50 per person.

Surgery of Trauma, Tuesday: All day Tuesday, May 27, will be devoted to a special program on the Surgery of Trauma. The Great Northern Railway Surgeons' Association which holds its annual meeting concurrently in Saint Paul, will unite with the Minnesota State Medical Association for this program. All surgeons in this region of the Northern Pacific Railway Co., the Omaha Railway Co., and the Soo Line Railway Co. have been invited to attend and two of the distinguished guest speakers on this program, Thomas M. Joyce, of Portland, and Sumner L. Koch, Chicago, will appear through the courtesy respectively of R. C. Webb, chief surgeon of the Great Northern and A. W. Ide, chief surgeon, Eastern Division of the Northern Pacific Railway Company.

Other Guest Speakers: In accordance with an established precedent, several societies are also sponsoring visiting guest speakers for this meeting. We are indebted this year to the following societies:

The Minnesota Radiological Society—speaker, LeRoy Sante, St. Louis, who will deliver the society's annual **Russell D. Carman Lectureship** in radiology.

The Saint Paul Clinical Club—speaker, Edward D. Churchill, Boston.

The Trudeau Society—speaker, Henry C. Sweany, Chicago.

The Northern Minnesota Medical Association—speaker, Henry H. Kessler, Newark, N. J.

Northwestern Pediatric Society—speaker, Albert D. Kaiser, Rochester, New York.

Open House: All convention visitors and their wives will be guests of the Minnesota State Medical Association and the Ramsey County Medical Society at an Open House and **Gay Nineties Show** to be held Monday night beginning at 7 p. m. in the Arena of the Saint Paul Auditorium. Exhibits will be open for leisurely inspection and there will be music and a vaudeville show at 9 p. m., featuring lively entertainment of the nineties. Refreshments will be served.

Medical Women's Luncheon: The American Medical Women's Association, Minnesota Branch, will hold a luncheon meeting at the Saint Paul Women's City Club, Monday noon, May 26. All women physicians are invited. Make reservations in advance through Nellie N. Barsness, 540 Lowry Medical Arts Bldg., Saint Paul. Tickets 75 cents.

National Physicians' Committee for the Extension of Medical Service: Minnesota members and all other interested physicians are invited to attend a luncheon meeting of this committee on Monday, May 26, 12:15 p. m., at the Hotel Saint Paul. John M. Pratt, of Chicago, Executive Administrator, will speak. Tickets 75 cents.

Alumni Dinner: Minnesota Medical Alumni will hold their annual reunion at 6 p. m., Monday, May 26, in the Casino, Hotel Saint Paul. Clifton M. Utley, of Chicago, Director of the Council on Foreign Relations, will speak on "America in a World of War." Open to all members of the Minnesota State Medical Association and their wives. A buffet dinner will be served. Tickets at the Registration Desk, $1.50 per person.

Reunion, Class of 1901: Members of the Class of 1901, of the University of Minnesota Medical School, will hold their 40th annual reunion dinner at the Hotel Saint Paul, Monday, May 26, at 6 p. m., W. H.. Aurand,. Minneapolis, chairman. Tickets $1.50 per person.

Northwestern Alumni Reunion: Northwestern Medical Alumni will hold their annual reunion dinner at the Hotel Saint Paul, Monday, May 26, at 6 p. m., H. R. Tregilgas, South Saint Paul, chairman. Tickets $1.50 per person.

Minnesota Society for the Prevention of Blindness: The society will sponsor a dinner meeting, Monday, May 26, at the Hotel Saint Paul, at 6 p. m. Gaylord W. Anderson, Professor and Head of the Department of Preventive Medicine and Public Health, University of Minnesota, will speak on "Conservation of Vision." F. E. Burch, of St. Paul, will introduce the speaker and Mrs. Alfred Pillsbury, Minneapolis, president of the organization, will preside. Tickets $1.50.

Golf: The annual Golf Tournament of the Minnesota State Medical Association will be held Sunday, May 25, at the White Bear Yacht Club. This is a fine course and a beautiful place and all medical golfers are urged to enter the tournament. A special invitation is extended to Auxiliary members to play also this year. Registrations should be made in advance with J. F. Noble, Ancker Hospital, chairman. Attractive prizes have been donated for tournament winners.

GUEST SPEAKERS

Sumner L. Koch is Associate Professor of Surgery at Northwestern University Medical School and attending surgeon at Passavant Memorial and Cook County Hospitals.

Thomas M. Joyce is Professor of Surgery and Head of the Department of Surgery at the University of Oregon Medical School.

Edward D. Churchill is John Homans Professor of Surgery and Chief of the West Surgical Service at Harvard Medical School and Chairman of the Surgical Executive Committee at the Massachusetts General Hospital.

Walter M. Simpson is Director of the Kettering Institute for Medical Research and of the Diagnostic Laboratories at Miami Valley Hospital, Dayton, Ohio; Lecturer in Internal Medicine in the Ohio State University Medical School and Special Consultant to the U. S. Public Health Service.

LeRoy Sante is Professor of Radiology and Director of the Radiological Department of St. Louis University Medical School and Chief Radiologist at St. Louis City Hospital, and at St. Mary's Hospital and Infirmary, the Firmin Desloge Hospital and the Mount St. Rose Hospital for Tuberculosis.

Henry H. Kessler is attending orthopedic surgeon at Newark City Hospital, New Jersey, Newark Beth Israel and Hasbrouck Heights Hospitals, and the Hospital and Home for Crippled Children.

Albert D. Kaiser is Associate Professor of Pediatrics at the University of Rochester School of Medicine, Assistant Pediatrician at Strong Memorial Hospital and former Chief of the Pediatrics Service at Rochester General Hospital.

Henry C. Sweany, Medical Director of Research, Director of Laboratories of the Municipal Tuberculosis Sanatorium, Chicago.

Colonel John R. Hall, M.C., is the Director of the Hospital Division, Surgeon General's Staff of the U. S. Army, at Washington, D. C.

BUSINESS PROGRAM

Hotel Saint Paul

Saturday, May 24

6:30 P.M.—Council .....Room 234

Sunday, May 25

10:00 A.M.—Reference Committees .....
Rooms to be Assigned
2:00 P.M.—House of Delegates...Continental Room
6:00 P.M.—Council .....Room 234
8:00 P.M.—House of Delegates....Continental Room

Monday, May 26

7:30 A.M.—Council .....Room 234
12:15 P.M.—House of Delegates.....Capitol Room

Tuesday, May 27

7:30 A.M.—Council .....Room 234

Wednesday, May 28

7:30 A.M.—Council .....Room 234
10:00 A.M.—Installation of Officers.....

SCIENTIFIC PROGRAM

Saint Paul Auditorium

Monday, May 26, 1941

Morning Session

A. M.

8:00 Visit Demonstrations, Scientific and Technical Exhibits

8:30 **Scientific Cinema** .....**West Arena**
The Fundamentals of Technique for Acute Surgical Mastoiditis
L. R. Boies.....Minneapolis

9:00 Histamine in Clinical Medicine
B. T. Horton.....Rochester

9:15 Shock Therapy for Psychoses
G. H. Freeman.....Saint Peter

9:30 Toxemias of Pregnancy
C. J. Ehrenberg.....Minneapolis

9:45 Use of Protamine Zinc Insulin in the Treatment of Diabetes Mellitus: Practical Application
W. A. Stafne.....Moorhead

10:00 Survey of Postoperative Results Following Surgical Correction of retrodisplacement of the Uterus
M. O. Wallace.....Duluth

(Intermission)

10:15 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema .....**West Arena**
Surgical Diathermy for Cancer of the Face
G. B. New.....Rochester

11:00 Recognition of Coronary Disease
H. E. Richardson .....Saint Paul

11:15 The Place of Drugs in the Clinical Management of Coronary Disease
R. V. Sherman.....Red Wing

11:30 New Developments in the Diagnosis and Treatment of Brucellosis
Walter M. Simpson.....Dayton, Ohio
Director, Kettering Institute of Medical Research

12:00 Lunch

Afternoon Session

P. M.

1:30 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema .....**West Arena**
Thyroidectomy
Martin Nordland .....Minneapolis

2:00 War Injuries of the Chest
Edward D. Churchill.....Boston, Mass.
John Homans Professor of Surgery, Harvard Medical School

2:30 Use and Abuse of Vitamins
H. R. Butt.....Rochester

2:45 Relation of Emotional Disturbances to Disease
L. R. Gowan.....Duluth

3:00 Office Proctology
H. E. Hullsiek.....Saint Paul

(Intermission)

3:15 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema .....**West Arena**
Intracapsular Cataract Operation
Extracapsular Cataract Operation
F. E. Burch.....Saint Paul

4:00 Pathological Interpretations of Radiological Shadows in Pulmonary Tuberculosis
Henry C. Sweany.....Chicago
Medical Director of Research, Chicago Tuberculosis Sanatorium

Evening—7:00 P. M.

Open House—Gay Nineties Show
Arena, Saint Paul Auditorium

Music, Floor Show, Dancing, Refreshments. All convention visitors and their wives will be guests of the Minnesota State Medical Association and the Ramsey County Medical Society at an *Open House* and *Gay Nineties Show* to be held Monday night beginning at 7 p. m. in the Arena of the Saint Paul Auditorium. Exhibits will be open for leisurely inspection and there will be music and a vaudeville show at 9 p. m. featuring lively entertainment of the nineties.

Tuesday, May 27, 1941

Morning Session

Surgery of Trauma

A. M.

8:00 Visit Demonstrations, Scientific and Technical Exhibits

8:30 **Scientific Cinema** .....**West Arena**
Hypospadias: Surgical Treatment by the Inlying Graft Method
V. S. Counseller.....Rochester

9:00 Head Injuries
W. P. Ritchie.....Saint Paul

9:15 Eye Injuries
A. D. McCannel.....Minot, N. D.

9:30 Injuries to the Soft Tissues of the Neck
T. J. Kinsella.....Minneapolis

9:45 Penetrating Wounds of the Abdomen
G. I. Badeaux.....Brainerd

10:00 Physical Examinations in Industry
E. V. Goltz.....Saint Paul

(Intermission)

10:15 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema .....**West Arena**
Gastro-Enterostomy
J. M. Hayes.....Minneapolis

11:00 Twenty-five Consecutive Compound Fractures
Thomas M. Joyce.....Portland, Ore.
Professor of Surgery and Head of the Department of Surgery, Oregon Medical School

11:30 Primary Treatment of Wounds
Sumner L. Koch.....Chicago, Ill.
Associate Professor of Surgery, Northwestern University Medical School

12:15 **Round Table Luncheons..Hotel Saint Paul**
Rating of Hearing Loss
Henry H. Kessler.....Newark, N. J.
Acute Appendicitis
Thomas M. Joyce.....Portland, Ore.
Diagnosis of Tuberculosis
Henry C. Sweany.....Chicago, Ill.
Chemotherapy in Treatment of Wounds
Sumner L. Koch.....Chicago, Ill.

Injuries About the Knee Joint
H. B. Macey.....Rochester
Strabismus in Children
A. D. Prangen.....Rochester
Management of Nerve Injuries
W. T. Peyton.....University of Minnesota
Emergency Surgery of Trauma
A. W. Ide.....Saint Paul
Office Gynecology
W. A. Coventry.....Duluth
Eye Ground Examinations
V. J. Schwartz.....Minneapolis

Afternoon Session

P. M.
1:30 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema .....West Arena
Facial Plastic Surgery
J. J. Hochfilzer.....Saint Paul
2:00 Split Skin Graft for Dermal Repair
H. O. McPheeters.....Minneapolis
2:15 Treatment of Shock
G. C. MacRae.....Duluth
2:30 Blood Bank, Sera, Plasma
J. T. Priestley.....Rochester
T. H. Seldon.....Rochester
2:45 Rating of Disabilities
Henry H. Kessler.....Newark, N. J.
Attending Orthopedic Surgeon, Newark City and Crippled Children's Hospitals

(Intermission)

3:15 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema .....West Arena
One-Stage Resection of Right Colon: End-to-End Anastomosis
C. W. Mayo.....Rochester
4:00 **Russell D. Carman Memorial Lecture**
Roentgen Observations of Chest Injuries
LeRoy Sante.....St. Louis, Mo.
Professor of Radiology and Director of Radiology Department, St. Louis University School of Medicine
Introduction
H. M. Weber.....Rochester

Evening—6:30 P.M.

Annual Banquet .....Hotel Saint Paul
Presiding: J. F. Borg, President, Ramsey County Medical Society
Introduction of Mrs. J. J. Ryan, Saint Paul, President, Woman's Auxiliary
Presentation of Southern Minnesota Medical Association Medal
Presidential Address: B. J. Branton, President, Minnesota State Medical Association
Address: Col. John R. Hall, M.C., Washington, D. C., Director of the Hospital Division, Surgeon General's Staff, U. S. Army.

Wednesday, May 28, 1941

Morning Session

A. M.
8:00 Visit Demonstrations, Scientific and Technical Exhibits
8:30 **Scientific Cinema .....West Arena**
Foley Y-Plasty, an Operation for Stricture at the Ureteropelvic Junction
F. E. B. Foley.....Saint Paul
9:00 Chemotherapy in Pneumonia
W. W. Spink.....University of Minnesota
9:15 Chemotherapy in the Treatment of Streptococcal Infections
W. E. Herrell.....Rochester
9:30 Chemotherapy in Acute Purulent Otitis Media and Mastoiditis
J. F. Curtin.....Minneapolis
9:45 The Present Status of the Newer Endocrine Therapy
M. H. Hoffman.....Saint Paul
10:00 **Installation of officers**

(Intermission)

10:15 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema .....West Arena
Hemorrhoidectomy: Dissection Method
W. A. Fansler.....Minneapolis
11:00 The Rôle of Tonsils and Adenoids in Respiratory Infections
Albert D. Kaiser.....Rochester, N. Y.
Associate Professor of Pediatrics, University of Rochester
Discussion opened by
Irvine McQuarrie.....University of Minnesota
11:45 Alcoholism as a Neurosis
G. R. Kamman.....Saint Paul

12:15 **Round Table Luncheons..Hotel Saint Paul**
Chemotherapy
W. W. Spink.....University of Minnesota
W. E. Herrell.....Rochester
Non-Tuberculous Diseases of the Lung
H. C. Hinshaw.....Rochester
Proctology
J. K. Anderson.....Minneapolis
Perineal Pruritus
H. E. Michelson.....Minneapolis
E. C. Hartley.....Saint Paul
Rheumatic Infection in Children
Albert D. Kaiser.....Rochester, N. Y.
Management of Peptic Ulcer
A. M. Snell.....Rochester
H. K. Gray.....Rochester
Acute Abdominal Emergencies
M. W. Alberts.....Saint Paul
Arthritis
C. H. Slocumb.....Rochester
Cardiac Emergencies
Moses Barron.....Minneapolis
Urological Problems
G. J. Thomas.....Minneapolis

Afternoon Session

P. M.
1:30 Visit Demonstrations, Scientific and Technical Exhibits
Scientific Cinema.....West Arena
Carcinoma of the Breast
H. B. Zimmermann.....Saint Paul

Medical Preparedness for National Defense

2:00 Preparedness in Minnesota: A Report
F. L. Smith.....Rochester
2:15 The Doctor in the New Army
Col. John R. Hall, M.C...Washington, D. C.
Director of the Hospital Division, Surgeon General's Staff, U. S. Army
2:45 Nutrition and Defense
R. M. Wilder.....Rochester
3:00 Physical Defects of Selectees
R. B. Hullsiek.....Saint Paul
3:15 Medical Officers of the Future
H. S. Diehl.....Minneapolis

Meeting of January 8, 1941

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town & Country Club on Wednesday evening, January 8, 1941. Dinner was served at 7 o'clock and the meeting was called to order at 8:10 p. m. by the President, Dr. John Armstrong.

There were forty-one members and two guests present.

Minutes of the December meeting were read and approved.

Dr. Armstrong expressed his appreciation to the members for the honor shown him in electing him as President for the coming year.

There being no old or new business to come before the Academy, the scientific program followed.

Dr. James A. Johnson, of Minneapolis, retiring President, read his Presidential Address. Numerous lantern slides were shown.

DIVERTICULA OF THE ALIMENTARY CANAL

James A. Johnson, M.D.
Minneapolis, Minnesota

I realize the subject of diverticula of the alimentary canal is rather extensive, and that I could well have confined myself to diverticula in a more restricted locality. The entire alimentary canal, however, is of similar anatomical construction and subject to the same defects, and I have, therefore, chosen to consider it as a whole.

The alimentary canal is composed of three layers of tissue to the diaphragm and has a fourth serous coat added in the abdomen. The arrangement varies somewhat with the function that it has to perform, but the same general tissue structure persists. They are the mucous or inner lining, the areolar or submucous, the muscular (largely arranged in circular and longitudinal fibres), and the serous or peritoneal layer within the abdomen.

A diverticulum can here be defined simply as a pouch or pocket leading off from the main tube of the canal.

Various classifications have been given for diverticula. I prefer here to make a simple division: (1) the true or congenital diverticulum, composed of all of the coats of the canal; (2) a traction diverticulum due to adhesions to the outside wall; and (3) the false or acquired diverticulum consisting largely of the mucous and submucous layers. The latter is by far the most common and consists of herniations through some defect in the canal, either congenital or acquired by weakening of the wall by disease. It is, therefore, not uncommon to find diverticula in more than one area of the canal at the same time.

Diverticula occur with regularity in definite locations throughout the alimentary canal. At first they were recognized only at postmortem examination, and later during operative procedures. During the past twenty years there has been constant improvement in roentgenological examination of the alimentary canal, and each year an increasing number of diverticula has been recognized, until now they should be of universal interest and importance to the medical profession.

Shiflett, in a routine x-ray examination of 768 stomachs and 887 colons found forty-four diverticula in the colon (4.96 per cent), thirty-three in the duodenum (3.74 per cent), six in the esophagus (0.79 per cent), five in the stomach (0.65 per cent), and only one in the small bowel. The relative frequency was colon, duodenum, esophagus, stomach and small bowel. This in general has been the experience of other observers. As to sex, they are of about equal incidence. Although they may occur at any age, it is usually during mid-life when patients seek relief. This is especially true of the acquired type, since they develop slowly and do not produce disturbances until they have reached sufficient size.

The etiology is either congenital or acquired. The congenital are due to embryologic remnants—as for example Meckel's diverticulum. The acquired occur from herniations either through anatomical defects or weakened areas in the wall as a result of disease, or from adhesions of surrounding structures to the outer wall of the canal producing tractions.

The symptoms in general depend upon the location and structure of the diverticulum. It may be present for many years without causing any trouble. The disturbance is largely due to retention of the contents of the canal, or an infection within the pouch. These naturally vary in different localities, and it will, therefore, be necessary to consider each area separately.

Esophageal Diverticula

There are two varieties of diverticula occurring in the esophagus; those that are due to pressure from within—the pulsion type of diverticula, and those that are due to traction from without—the traction diverticula. About 90 per cent of all diverticula in the esophagus are of the pulsion type and occur most commonly between the ages of fifty-five and sixty. They are due to a weakness in the posterior wall of the pharynx at a point where the cricopharyngeus and inferior constrictor muscle fibres meet. At this point there is a weak locality which is just posterior to the cricoid cartilage. Through this opening gradually occurs the herniation of the mucous and submucous layer of the posterior wall of the pharynx. The bolus of food constantly strikes against this area when swallowed, and a herniation of the mucosa and submucosa gradually takes place. At first, directly back, and later as the sac enlarges, it usually appears on the left side of the neck; rarely on the right.

The symptoms depend upon the size of the sac. At first, when it is small, there may be only chronic irritation and a dry unexplainable cough. Later, as it enlarges, there is regurgitation of undigested food, a gurgling sound on swallowing due to the air taken into the sac, often a sour odor to the breath; and later when the sac becomes very large and pulls upon the esopha-

gus, there is constriction with inability to swallow solid food and gradual loss of weight. When the sac is very large and causes pressure, there is at times marked dyspnea.

The diagnosis is made by x-ray examination, which demonstrates clearly the retention of the opaque mixture directly behind and below the pharynx. If the picture is not typical, the differential diagnosis should be made with the esophagoscope, since a cicatricial or compression stenosis of the upper part of the esophagus may produce a similar picture from the dilatation which occurs above. A perforation of the posterior wall of the esophagus which has allowed the opaque mixture to gravitate into a pocket may also produce a similar picture.

Treatment will depend somewhat upon the size of the sac. If it is small, dilatation of the esophagus below may give relief for a considerable time. However, all sacs continue to enlarge and most patients will require operation sooner or later. The chief danger in the operation is the descending infection along the fascial and muscle planes of the neck down into the mediastinum. There are two plans of surgical removal; first, the so-called two-stage operation, which is still advocated by most surgeons. The first stage consists of dissecting out the diverticulum through a tranverse or longitudinal incision in the neck. It is then brought up into the wound and placed high so that it tends to empty itself and no food can regurgitate into it. Gauze is then packed below it to produce adhesions, which at a later stage will have walled off the mediastinum so that there is no danger of leakage. At the second stage, one week to ten days later, the wound is again opened. The sac is tied off at its junction with the esophagus and resected, or in some instances removed without ligation, in which case a fistula will persist for a while but gradually close.

In October, 1937, Lahey reported eighty-two cases in which this method of operation was employed with only one death, which was due to uremia and not to any failure of technique. In discussing Dr. Lahey's paper, Dr. Thomas Shallow and Dr. W. Wayne Babcock contended that the one-stage operation was just as safe and would give better anatomical and functional results. Dr. Harrington of Rochester advocated the one-stage for the small diverticula, and in general, the two-stage for the very large diverticula. Hollinger and Jackson advocate placing the esophagoscope into the diverticulum, aspirating its contents, using the scope to light up the diverticulum during its dissection from the neck, and then elevating it into the wound. The scope is then introduced into the esophagus proper, the diverticulum is removed, and the hernia of the esophagus is repaired over the scope to obviate any stricture. There is no doubt that this type of operation is more accurate and gives a direct surgical repair of the hernial opening. For the average surgeon the two-stage operation is probably the safest.

Diverticula occur at or just above the bifurcation of the trachea. They are usually the result of traction by adhesions of inflammatory glands in the mediastinum. The mouths of these diverticula are usually large and as a rule do not retain any material but empty freely into the esophagus. Not infrequently a dilatation of the esophagus below the diverticulum is required. If they become very large, which seldom occurs, Hollinger suggests that they can be relieved by compression with artificial pneumothorax. They seldom require operation, which is fortunate because the risk is very great in this particular locality. The supradiaphragmatic diverticulum is relatively rare. At a point just above the diaphragm there is often a weak spot in the esophagus. When a spasm of the cardia occurs, there may be a herniation of the wall at this point. Unless the sac is large, the condition is usually relieved by dilatation of the cardia. If the sac is large, it can be sutured upright along the wall of the esophagus, or if feasible, an anastomosis of the diverticulum to the fundus of the stomach can be made.

Diverticula of the Stomach

Diverticula of the stomach are comparatively rare. Lay Martin in 1936 in the Annals of Internal Medicine states that since 1920 he found five cases in the records of the Pathological Department at Johns Hopkins University and Hospital, and another additional case discovered by x-ray examination. He made an exhaustive research of the literature and says that the first case apparently was discovered by Baillie in 1793, and since that time he was able to find ninety-two additional cases of pulsion diverticula which he carefully tabulated. Two of these were found in embryo and one in a four-month old infant. Most of them occurred in mid-life. Fifty-four of the 103 cases were women.

Shiflett in 1937 made a clinical analysis of forty-three cases collected from the literature and reported five personal cases. He concluded that the incidence was about .50 per cent. Eusterman and Balfour state that there had been fourteen proven cases at the Mayo Clinic prior to 1935, in ten of which surgical removal was accomplished, four having been recognized at postmortem examination. Diverticula of the stomach can be divided into three types: (1) the congenital or true diverticulum which consists of the entire wall of the stomach; (2) the pulsion type which results from herniation through some weakened portion of the muscular wall; (3) the traction diverticulum which is due to adhesions to the outside of the stomach wall. The most common location is at the cardiac end of the stomach, where the musculature is less developed. Of the 103 cases of pulsion diverticula collected by Lay Martin, 61 per cent were at the cardiac area while 39 per cent were distributed along the lesser curvature, either on the anterior or posterior wall. The average size was 1 to 6 cm., although a few were considerably larger.

The histology depends upon the type of diverticulum. The true or congenital type has the entire stomach wall. The pulsion or herniation type is represented only by the mucous and serous coats. Martin found a pancreatic rest or nodule at or near the tip of the diverticulum in fourteen of the 103 cases collected.

The symptoms are often lacking or consist only of mild gastric distress of an indefinite nature. When the sac retains the contents of the stomach or becomes infected, there is gastric distress with a burning pain

high up in the left epigastrium under the rib margin. A case of ruptured diverticulum has never been reported. In some cases there is eructation of food and occasionally vomiting.

The diagnosis is made by x-ray examination, but this can be done only when the barium is admitted and retained in the pocket. No doubt, therefore, many are overlooked, especially when there are no localizing symptoms. In carrying out the treatment, it is first necessary and very important to exclude all other lesions that could produce the existing symptoms. Secondly, after an exclusion of other lesions has been made and it is definite that the symptoms present are due to the diverticulum, all cases should first have thorough and careful medical management by a properly selected diet, antispasmodics and acid neutralization when necessary. Occasionally postural relief is obtained. Operation should be advised only when it is definitely established that the diverticulum is the cause of the symptoms and after careful medical treatment has been instituted. As an illustration of the above condition, I would like to report the following patient operated upon by me on March 11, 1940, the case having been previously reported in the Nicollet Clinic Bulletin for April, 1940.



Fig. 1. Mrs. C. H. Diverticulum of the posterior wall of the stomach near the esophageal opening.

Mrs. C. H., aged forty-nine, began to have epigastric pain with regurgitation of food and vomiting in 1921. An x-ray study at that time had revealed a pouch in the upper part of the stomach. An exploratory laparotomy had been done in 1924 and the surgeon reported to her that the stomach was adherent to the posterior body wall. The adhesions were freed and she was relieved of her gastric symptoms for about ten years. In 1935 she again began to complain of pain directly after eating. Regurgitation of food with occasional vomiting occurred. The pain was severe, of a burning character, and located high in the left epigastrium under the rib margin. She was unable to eat any food without distress. She had lost considerable weight. The physical examination was essentially normal except for an aortic stenosis which had apparently followed a severe attack of rheumatic fever at about the age of twelve, and was now producing some shortness of breath on exertion. The blood, urine and gastric contents were all normal.

X-ray study of the gall bladder revealed normal function and no evidence of stone. Roentgenological examination of the gastro-intestinal tract revealed a diverticulum on the posterior wall of the stomach high up near the cardiac end. The diverticulum retained the barium at the end of twenty-four hours and there was considerable local tenderness directly over it. The rest of the stomach and duodenum was normal. She was admitted to the hospital on February 22 for medical treatment of this condition. While resting in bed in the hospital, dietary, medicinal and postural attempts were of no avail. There was no relief of the epigastric distress. The cardiac condition by this time seemed much improved. An operation was, therefore, decided upon.

On March 11, 1940, she was operated on. The posterior wall of the stomach was explored and a diverticulum found close to the greater curvature and just below the esophagus. Under traction it was about 3 inches long and considerable narrowing was present near its entrance to the stomach. The walls of the diverticulum consisted of mucosa, submucosa and serosa. There was no muscular layer and no evidence of a pancreatic rest. The postoperative convalescence was normal and since her operation she has been relieved of her epigastric distress and is able to eat in a normal way. However, she still complains of some dyspnea which is due to her cardiac condition.

Diverticula of the Duodenum

Edwards in his recent work on diverticula of the intestine states that the first case of a duodenal diverticulum was reported in a pathological specimen in 1710. Prior to about 1920 there were only scattered reports in the literature. Many of them were found in pathologic specimens. During the past twenty years a wide interest has developed in this condition, mostly as a result of improved roentgenological diagnosis in this locality. The incidence now on routine roentgenological examination is about .75 per cent. The average age is fifty to sixty years. It appears about equally in both sexes.

Duodenal diverticula from an etiological standpoint can be classified into three types.

1. The ulcer type occurs in the first part of the duodenum and is the result of an ulcer scar, which causes a weakening of the wall or in some instances a narrowing of the opening so that by intraluminal pressure a pouch appears on the outside. This pouch is a herniation of all the layers of the duodenal wall.

2. The pulsion type is due to a weak spot in the muscle wall as a result of the entrance or exit of the bile and pancreatic ducts, or the openings through which vessels pass, or occasionally a pancreatic rest. Through these weakened areas in the muscular wall a herniation of the mucosa and the submucosa takes place. These occur on the lesser curvature in the second and third part of the duodenum.

3. The traction type results from adhesions to the

outer wall of the duodenum and produces a pouching of the wall by its traction. This is comparatively rare.

There are no typical symptoms of a duodenal diverticulum. Many, having never produced symptoms, are discovered on routine x-ray examination. It is only when the pouch retains the material or becomes infected that localizing findings occur. Symptoms may suggest almost any upper abdominal lesion.

The diagnosis is made by x-ray examination, and the diverticulum will be found only when the barium is admitted and retained in the pouch. When there is infection present, a localized tenderness may be noted. A diverticulum occurring about the pancreatic and bile ducts may by its pressure sometimes produce jaundice.

In considering treatment, it is first necessary to rule out by careful examination all other lesions that could produce similar symptoms in this locality. Secondly, nearly all duodenal diverticula will respond to medical treatment. It is only when constant retention is found in the pouch, when there is repeatedly definite tenderness over the pouch, either due to retention of material or inflammation, that operation should be considered. As an illustration, I would like to report the following case.

Mrs. H., aged eighty-five, came to the office for examination in April, 1937, complaining of almost constant distress, pain and soreness in the epigastrium. Occasionally she would vomit several hours after a meal. Previously she had been operated upon for cystic disease of the breast, for fibroids of the uterus, and an inguinal hernia. She had had a questionable heart attack about a year ago and was kept in bed for several weeks. On physical examination the heart was found to be normal in size. Electrocardiogram showed evidences of early myocardial damage. The blood pressure was 174 systolic and 90 diastolic; blood and urine were normal. X-ray study of the gall bladder revealed normal function with no evidence of stone. The stomach was likewise normal. However, there was a large diverticulum in the third part of the duodenum which at the end of twenty-four hours retained barium and was quite sensitive to pressure at the time of examination. She was confined to the hospital for some time on a low residue diet, antispasmodics and postural treatment without any relief.

On May 25, 1937, she was, therefore, operated upon. In the third part of the duodenum just to the right of the mesenteric vessels on the posterior and upper aspect of the duodenum was a diverticulum about 2 by 1.5 inches. It had herniated through the wall and the index finger could be passed through the opening into the bowel. The duodenum was completely mobilized from below upward without disturbing the circulation above and the adjacent pancreas. The sac was then tied off and the hernial opening in the muscle repaired. On examination there were no other lesions in the abdomen. The diverticulum consisted of mucosa, submucosa and a few muscular fibers. On examination October 26, 1937, nearly seven months after her operation, she stated that she was entirely relieved of her digestive symptoms. On x-ray examination a normal duodenum was found and there was no evidence of any local tenderness.

Diverticula of the Small Intestine

There are two types of diverticula of the small intestine: (1) the pulsion or herniation type; (2) the congenital or Meckel's diverticulum. The pulsion diverticulum is almost entirely confined to the jejunum. As a rule it is only found in the ileum when the entire small intestine is involved. According to Guthrie and Brown, the first case was reported and described by Sir Astley Cooper in 1844, when he found pouches in the

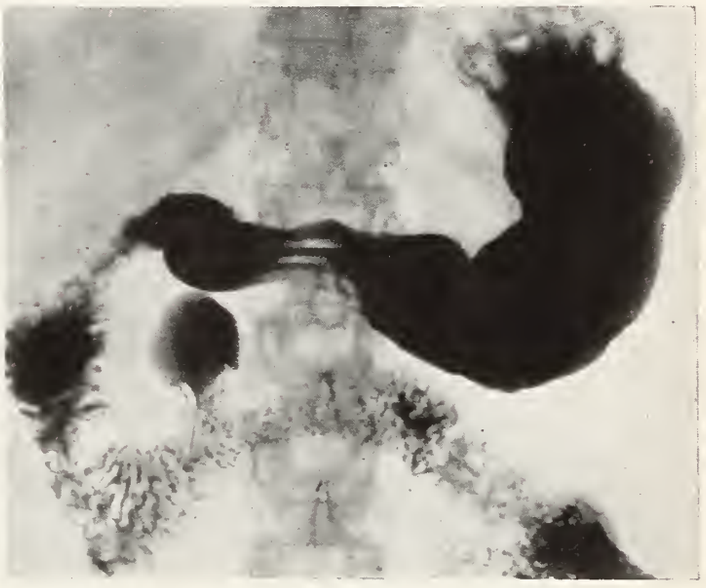


Fig. 2. Mrs. H. Large diverticulum of the third part of the duodenum.

proximal portion of the small intestine in a postmortem examination. The first roentgenological diagnosis was described by Case in 1920. They further state that it is probably present in about .50 to .10 per cent of routine roentgenological examinations of the gastro-intestinal tract. Rankin and Martin estimated that it would be found only once in every 25,000 routine roentgenological examinations of the gastro-intestinal tract. It is the least frequent location in the alimentary canal for diverticula. Edwards collected sixteen cases in a period of twelve years at Kings College Hospital in London: eight were found at postmortem, four at operation, and four on x-ray examination. The average age was 55. Nine were in men and seven in women. Hubeny and Pollack stated that since 1934, twenty-nine cases were reported: six found on x-ray examination, seven by operation and fifteen at postmortem.

The etiology has been well established and illustrated by Edwards and others. They herniate through a weak area in the intestinal wall and occur with regularity on either side of the mesentery, where the blood vessels perforate the muscle coats. Later, as they enlarge they may fuse from either side and join to form a large diverticulum in the mesentery. The pressure from within the bowel causes a herniation of the mucosa and submucosa through these weakened areas.

The symptoms from small diverticula are unimportant. However, when they enlarge, to retain the contents of the intestine, or become inflamed, there is epigastric distress together with nausea and occasional vomiting. Hemorrhage, perforation or, if the diverticulum becomes large enough, obstruction may occur, especially by a volvulus.

The diagnosis is made by x-ray examination and can only be made when the diverticula are large enough to admit the barium and especially to retain it.

In the treatment it is necessary here, as it was in

gastric and duodenal diverticula, to rule out all other lesions in the upper abdomen which might produce the given symptoms. If the diverticulum is small and does not constantly retain material and becomes infected, the patient will usually do well on medical treatment. It is only when symptoms persist after careful medical treatment or when complications such as perforation and obstruction occur that operation is necessary. If the diverticulum is single, it can be resected here as elsewhere. They are usually multiple, however, and in that case the area involved must be entirely removed.

Meckel's diverticulum is an embryologic remnant of the omphalomesenteric duct. When the embryo is about five weeks old, the duct has no further function and normally disappears. In about 2 per cent of persons, however, some form of remnant of this duct remains. In 1822 Meckel first accurately described its embryologic origin and the disease to which it was subject. Meckel's diverticulum is usually found in the lower ileum about 1 to 3 feet from the ileocecal junction. It has a great variety of sizes and shapes and its distal end is often attached to the abdominal wall at the umbilicus, either by a remnant of its obliterated portions or by the obliterated omphalomesenteric vessel. For some unknown reason it occurs three times as often in men as in women. It produces no typical signs or symptoms and its presence is usually recognized at the time of operation, although an occasional case has been found on x-ray examination. Meckel's diverticulum may become inflamed like an appendix and give rise to much the same symptoms. When the abdomen is opened for an acute appendicitis and the condition of the appendix does not explain the symptoms, the lower ileum should always be examined for the possible presence of a diverticulum. Occasionally it contains foreign bodies. One such case was reported before this Society in 1932 by Dr. Archa Wilcox, in which a fishbone had lodged and penetrated the walls to cause the inflammation. The most common disturbance, however, is acute intestinal obstruction.

In December, 1922, I described the mechanism of this before the Minneapolis Surgical Society and reported three cases. In May, 1932, I reported an additional case of acute intestinal obstruction due to Meckel's diverticulum before this Society. It is estimated that Meckel's diverticulum accounts for about 3 to 4 per cent of all cases of acute intestinal obstruction. There are a great variety of ways in which the obstruction may be brought about. First, when the diverticulum is attached to the abdominal wall, it may by its traction cause an angulation at its junction with the intestine, or the intestine being suspended in this way may rotate on a fixed point, causing the volvulus, or the loop of free bowel may twist itself about the cord attached to the diverticulum. Secondly, when there is a long diverticulum or a cord is attached to its tip, floating free in the abdomen, it may become adherent to another loop of bowel or to the mesentery or omentum, thus forming a band underneath which a portion of the bowel has become strangulated. Meckel's diverticulum is not an infrequent cause of intussusception in children. This occurs usually by the diverticulum being inverted into the lumen of the bowel, and then being pulled forward by the peristalsis. In one of my patients this resulted from the tip of the diverticulum becoming adherent to the outer wall of the intestine and then being caught by the peristaltic wave in such a way as to produce the intussusception. Meckel's diverticulum has a greater potential danger than the appendix and should be removed if found during the course of an abdominal operation.

Diverticula of the Colon

Incidence.—The colon is the most common location for diverticula in the alimentary canal. Ochsner and Bargen state that in 2,984 patients examined roentgenologically by barium enema, 7 per cent had diverticulosis. It was uncommon before the age of forty, most common between the ages of sixty-five and seventy-five. They were least common in the right colon and most common in the sigmoid flexure. Edwards states that in thirteen and one-half years, 2,139 examinations of the colon by barium enema were made at Kings College Hospital, and that 16.08 per cent over the age of thirty-five were found to have diverticula. He believes, however, this incidence to be high because all of these patients were examined because of colon symptoms. The average age was fifty-nine and it was found to be equal in both sexes. Shallow reports that diverticula occur in about 5 per cent of colons examined roentgenologically by barium enema over the age of forty, and that about 12 to 15 per cent of these develop diverticulitis. Most observers agree that it is of about equal incidence in both sexes, but that diverticulitis and its complications occur most frequently in men.

Etiology.—It has definitely been established by Edwards, Dixon, Deuterman, Weber and others that diverticula of the colon are due to herniation of the mucosa through the musculature of the bowel, where it is weakened by the entry of its vessels. The location of the diverticula corresponds to the entry of the vessels and also the site of the appendices epiploicæ. It is only in the severest cases, and then rarely, that the diverticula penetrate through the logitudinal muscle bands. They occur as the result of intraluminal pressure which pouches the mucosa through the weakened area, and they consist of the mucosa surrounded by a very thin layer of muscle fiber. At first such herniations are small, but they constantly tend to enlarge and become sacculated so that the pouch is often bottle-shaped with a narrow opening into the bowel. When they have arrived at this stage, they retain bowel contents and become infected, causing a series of complications.

The symptoms of uncomplicated diverticula usually consist of vague bowel disorder, much the same as we ordinarily attribute to a spastic colon. The diagnosis is made by roentgenological examination with barium enema. In the early stages they appear as irregular indentations between the haustra. Later they can be recognized as sacculations often with a narrow opening, and when the enema is expelled, show retention of the barium.

The treatment in uncomplicated diverticula is directed largely toward preventing complications, and consists of a low-residue diet together with liquid petro-

latum to soften and regulate the stool. Antispasmodics are frequently required. Regular habits, mental and physical hygiene are important. Anyone who has diverticula of the colon should be warned of the possible complications so that he may properly appreciate the

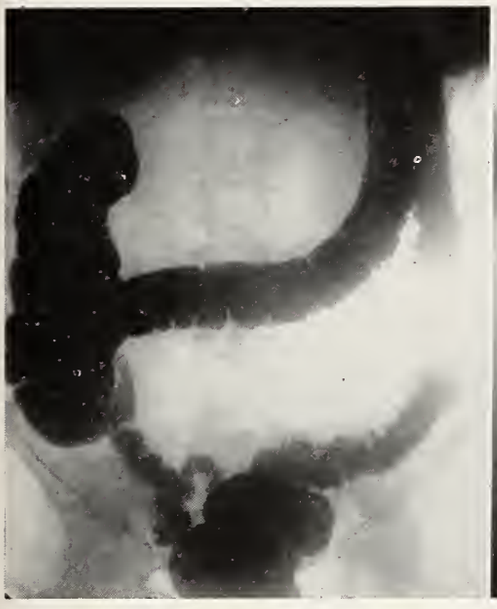


Fig. 3. Diverticula of the descending colon and sigmoid. This patient has had repeated attacks of mild uncomplicated diverticulitis.



Fig. 4. Peridiverticulitis of the descending colon with constriction simulating carcinoma. Operated upon August 19, 1940.



Fig. 5. Advanced diverticula of the sigmoid colon with repeated attacks of diverticulitis resulting in a mass in the pelvis and repeated temporary obstruction.

treatment to avoid them, and if they occur, to seek early medical consultation. The complications are due to various degrees of inflammation of the diverticula and are the main issue and danger to be considered. For the sake of clarity they can best be classified in accordance with the pathologic changes which occur and disturbances each of these produces.

1. *Uncomplicated diverticulitis usually of a mild recurrent type.*

This condition is no doubt more common than is generally recognized. It is not infrequently looked upon as a spastic colon, and often produces much the same symptoms, except that it is more severe, especially as to pain and constipation, and it is also recurrent. The pain is often severe and is usually located in the lower abdomen, especially on the left side. It is not infrequently mistaken for other acute abdominal lesions, especially in the pelvis. During the attack, especially if there is fever and a good deal of pain, there should be no attempts at roentgenological diagnosis with barium enema, since the pressure of this may cause a perforation. I have seen two such instances. During the attack such patients, especially if there is fever, should be kept in bed, have heat to the abdomen and sedatives to relieve pain. The diet should consist of liquids until the attack has passed. These patients usually remain quite well on careful medical management but are constantly subject to attacks when they overindulge in forbidden foods or become indiscreet in other activities. Some of these in time develop the more serious complications.

2. *Diverticulitis with peridiverticulitis.*

This is a more advanced condition in which the inflammation involves a localized area and has spread to the wall of the bowel and often causes a constriction, either partial or complete. The sigmoid is the most common location, but the transverse and descending colon is occasionally involved. Not infrequently such cases are mistaken for carcinoma. This was especially true before roentgenological diagnosis had arrived at its present perfection. There is still an occasional case where a questionable roentgenological opinion has to be given, and an exploratory laparotomy has to be undertaken in order to prove the condition.

On August 19, 1940, I operated, for example, on a woman aged sixty-seven who was in other respects very well. She had complained of attacks of pain over the midportion of the descending colon for the past five years. During the three weeks previous to her admission the pain had been especially severe and she had had increasing constipation. The x-ray showed a constriction in the descending colon just above the sigmoid. There was a diverticulum above and below this constriction. It was diagnosed roentgenologically as a probable carcinoma. At operation the mass on examination could not be distinguished from a carcinoma. It was, therefore, resected by a two-stage Mikulicz's operation. The pathological diagnosis was an inflammatory mass due to peridiverticulitis. She has had complete relief from all of her symptoms from which she suffered during the past five years.

In the sigmoid where the diverticula are larger and more numerous, a large mass often develops. Here usually there is a great deal of inflammation and the tumor mass becomes fixed in the pelvis. Partial or complete obstruction often develops, and not infrequently requires a colostomy. Some of the severest cases may have to be content with a permanent colostomy, but most of them can later be closed after the involved

area has been given a complete rest and irrigated to clear up the inflammation. It is certain that no attempt should be made to remove the area involved except when the inflammation has subsided and it is high enough to do a two-stage resection safely.

3. *Diverticulitis resulting in perforation.*

This is the most serious complication of diverticula and often requires a great deal of judgment on the part of the surgeon. Here experience is of paramount importance. It is necessary to consider two types of cases.

(a) The acute perforation directly into the peritoneal cavity.

This fortunately is comparatively rare because in most cases there has been previous inflammation and a walling off. However, occasionally an acute perforation occurs, which as a rule is quite dramatic and requires immediate operation, just as in gastric or duodenal perforation. If possible, the perforated area should be brought outside the abdomen like a colostomy. If this cannot be done, the perforation should be covered by omentum and a drain placed over the area involved. It is usually inadvisable and often quite impossible to close the perforation. There is usually so much inflammation and edema around it that if an attempt is made to close it, often more harm than good is done. A colostomy above the perforation should be done.

(b) The perforation resulting in a localized abscess.

If there have been previous attacks, one is fairly safe in assuming that a localization will occur. It is important here not to "rush in" but to wait until a localized abscess has formed. Such abscesses occasionally remedy themselves by draining back into the bowel, but in most cases drainage through the abdomen is necessary. Here it is best to be conservative and not to hurry, and it often requires considerable courage on the part of the surgeon to wait for the proper time.

4. *Diverticulitis resulting in an internal or an external fistula.*

A diverticulitis area may become adherent to adjacent structures into which it perforates and either a temporary or permanent fistula may result. The most common location is between the sigmoid and the urinary bladder. In fact, one might say this is not an uncommon complication. When such a perforation takes place, a colon bacillus cystitis at once develops which must be given immediate attention. Next, it is usually necessary to do a colostomy and follow this by irrigating the involved area of inflammation. After the inflammation has entirely subsided, the fistulous opening in the bladder can be closed with safety. The involved diverticulous area in the bowel can then be resected in the same way as a carcinoma. Occasionally the involvement is so extensive or so low down in the sigmoid that it cannot be resected. In such instances a permanent colostomy is the only alternative.

I have observed one instance in an old person over a period of many years, where the fistula has acted as a safety valve for recurrent attacks of diverticulitis in the sigmoid. At times it would rupture into the bladder, a cystitis would occur temporarily and there would be freedom from pain. The stools would be normal and regular following these attacks for many months. A perforation may occur into an adherent loop of bowel, usually the ileum. If this is permanent, it often causes considerable distress and loss of weight, and in such instances the involved loops may have to be resected. An external fistula may occur either through the abdominal wall where the abscess has been drained, or about the pelvic floor where the abscess has found its way along the muscle and fascial planes. I have not made a practice of closing these. If the diverticulitis should permanently subside, they will automatically close themselves. Otherwise, they should be left as a safety valve for drainage during the attack of diverticulitis.

5. *Diverticula and diverticulitis as a cause of cancer.*

There has been much discussion for many years relative to the relationship of carcinoma to this condition. Shallow, Brown and Marcley have been unable to establish any relationship and conclude that it was largely a matter of chance. It is not uncommon to find carcinoma in patients who also have diverticula, but it has often been noted that they occur frequently in a part of the colon not involved with diverticula. It must be remembered that the common site for both lesions is the sigmoid colon, and that they both occur most frequently in the fifth and sixth decades of life. I have been unable to find anyone who has definitely established a relationship between carcinoma and diverticula of the colon. I, therefore, believe that it can be dismissed as of minor importance.

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The meeting adjourned.

E. V. Kenefick, M.D.
Secretary

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, December 5, 1940

President JAMES A. JOHNSON, M.D., in the Chair

Secretary, R. F. McGANDY, M.D.

SURGERY IN DIABETIC GANGRENE

James M. Hayes, M.D.

Minneapolis

Both conservative and radical surgery in diabetic gangrene have been rather widely discussed recently. No surgeon desires to amputate a leg that may be saved and rendered useful.

It is generally agreed that the degree of interference with circulation and infection are the two most important factors influencing the course and treatment in diabetic gangrene.

Surprising as it may seem, there are some reputable surgeons who advise against the amputation of a toe, but favor amputation of the leg in diabetic gangrene of a toe. They maintain that the chances of spreading infection in amputation of a toe is too great to warrant this procedure. Others advise against amputation of a leg in any case because of the high mortality in these cases.

At the Western Surgical meeting last year, I was surprised to hear so good a man as Dr. Maes[2] say nothing short of leg amputation should be done in case of moist gangrene of a single digit.

The introduction of insulin has been a great boon not only to the ordinary diabetic patient but to much greater extent to the one with diabetic gangrene. As in other operations on diabetic patients the blood sugar must first be controlled.

Recently some interesting and exhaustive studies have been made in various clinics over the country on the subject of diabetic gangrene.

One of the most interesting is that by Pearse and Ziegler,[3] of the University of Rochester, New York, which appeared in *Surgery*, July 1940. They reviewed their study of 211 diabetic patients with varying degrees of gangrene of the feet. Their conclusions from this study were as follows:

1. Treat conservatively so long as the lesion or infection is confined to the digit. Twenty-five per cent were cured when treated in this manner.

2. Treat conservatively in case of adequate circulation. Leg amputation is a useless sacrifice in these cases. Ninety per cent of these patients were cured by operation on the foot. Failure of the first operation does not increase mortality nor reduce the chances of success.

3. Conservative treatment is not indicated in the presence of inadequate circulation. Delay in these cases may permit extension of infection in the foot.

4. Removal of gangrenous or infected parts offers no increased risk but the wounds rarely heal.

5. In severe cases, removal of the foot and later leg amputation is indicated.

6. Mortality in acutely infected cases is 45 per cent.

They have attempted to classify these patients as to the degree of interference of circulation.

1. Patients with poor circulation have a history of claudication and rest pain. The member is cold, discolored and pulseless. Trophic changes are present in the skin and nails. There is an absence of popliteal pulse. Calcified vessels are evident and there is no rise of temperature by vasomotor test.

2. Patients with fair circulation have some history of claudication but no rest pain. Pulsations in the dorsalis pedis and posterior tibial are gone but not in the popliteal artery. There is a moderate rise of temperature.

3. In patients with good circulation, slight general symptoms, some pulsation in dorsalis pedis and posterior tibial, toe amputation gave 11 per cent mortality; leg amputation gave 32 per cent mortality. Secondary operations did not increase the rate of mortality. Suppuration in the plantar surface of the foot was a real hazard and usually local operation was avoided.

Leland and McKittrick, in Massachusetts General Hospital, reviewed 559 patients with varying degrees of diabetic gangrene. They advise leg amputation if one or more toes are involved, with involvement of deeper structures and no pulsation in the dorsalis pedis artery; also, if there is osteomyelitis of a phalanx.

William Crawford White says: "It is our practice to advise amputation in any case of diabetic gangrene where the amputation of more than one toe is to be performed. Simple amputation of a toe is unsuccessful because gangrene and infection spread and necessitate leg amputation."

Such widely diversified opinions from surgeons with so great experience leaves the average individual at sea as to how to treat these cases.

In these discussions it would appear that one could draw a definite line between those who could be operated upon locally and those in whom leg amputation is definitely indicated.

I am convinced that the absence of pulsation in the dorsalis pedis, posterior tibial, or even the popliteal artery does not always indicate leg amputation. If these vessels are shut off gradually, the collateral circulation is frequently quite well established. Only by close observation for some period of time can it be definitely determined how much circulation is shut off. Control the diabetic condition and infection, and one can safely wait for developments.

All gangrenous or necrotic areas should be considered infected from the start. To stop the spread of this infection at this point is perhaps the most important factor in the entire process. The large antiseptic wet pack, properly applied for forty-eight hours, gives most satisfactory results in controlling

this infection. One can then wait for the line of demarcation. As soon as this line forms, the necrotic tissue should be cut away. No bone should be left protruding or even near the surface. The wound should not be tightly closed, nor should any tension



Fig. 1. Illustration showing all but great toe missing (Case 5).

be placed on these tissues. The wet antiseptic pack should be applied again after surgical interference.

If the infection has not extended too widely before this pack is applied, it usually is quite readily controlled.

If the gangrenous area extends, repeated operations may be necessary and successful. If the function of the foot is destroyed, then amputation of the foot may be justified, with later amputation of the leg either below or above the knee.

Amputation through the thigh usually occasions considerable shock. Much of the shock may be prevented by the administration of spinal anesthesia.

I have six cases to present in all of which leg amputation had been advised. Four of these six patients are alive and well today, with good functioning feet and legs. Two of them were not seen early, and neither the diabetic condition nor gangrenous areas had been treated in time to save their lives. They are examples of neglect in controlling both the diabetic condition and local infection.

Case 1.—A woman, sixty-eight years of age, had had diabetes for twenty years. She had recently lost her husband and lived alone. She became careless in her control of her diabetes. When gangrene and infection appeared she neglected to consult a physician until her general condition was very poor.

The usual procedure was carried out to save the foot, but the gangrene gradually spread. The leg was amputated in the lower thigh, under spinal anesthesia, but the patient gradually succumbed.

Case 2.—A man, seventy-eight years of age, who lived in the country, had had diabetes for several years and an extensive arteriosclerosis. The gangrene and infection began in the great toe. This extended for some time before any treatment was instituted.

After preliminary treatment, the great toe was amputated. Later, the next toe was cut away. The entire foot then became gangrenous. While we were



Fig. 2. Three toes, the middle metatarsal and most of the first metatarsal have been removed (Case 6).

waiting for the family to consent to amputation, the patient had a cerebral accident and passed out.

With these two patients, the cause of death was perhaps neglect of control of the diabetes and infection in the early stages.

Case 3.—A woman, aged sixty-three, had diabetes for several years. On entering the hospital, she had a 4+ sugar in the urine, and a blood pressure of 210/110. The little toe of the right foot was gangrenous. The antiseptic wet pack was put on for forty-eight hours, and the little toe amputated in December 1930. In March 1931, the third toe of the right foot was amputated; in July 1931, the fourth toe and in December 1931, the second toe of the same foot was amputated. About two years later, the second toe of the left foot was amputated.

At the time of the first amputation no pulsation could be felt in either the dorsalis pedis or the posterior tibial arteries. Today, the patient walks well on both feet with no apparent limp. She has just recently been operated for cataract.

Case 4.—A man, aged sixty-one, had only recently discovered that he had diabetes. His blood pressure was 200/90. There was sugar in the urine. The hemoglobin was 50 per cent, and the leukocyte count was 11,400.

On November 6, 1935, he came to the hospital with an extensive gangrene of the right great toe and surrounding tissues. He came in for leg amputation. After treating the infection, the right great toe and surrounding tissues were cut away. On December 15, 1936, the left great toe was cut away. On January 14, 1937, the head of the left metatarsal was removed and on June 8, 1939, the fourth toe of the right foot had to be amputated. Today, the patient is walking around on both feet in comparative comfort.

Case 5.—A man, aged seventy-six, had diabetes for five years. He had sugar and casts in the urine. His temperature was 100°, and blood pressure 160/70. He had had a cerebral hemorrhage one year previously. He had some paralysis of his right hand and foot at this time.

In March 1939, the left little toe was entirely gangrenous. This was removed. Later three successive operations were done until only the great toe remained. Much of the metatarsal area was also cut away (Fig. 1). Since the right foot is partially paralyzed, this foot is much more useful now.

Case 6.—A man, sixty-five years of age, had had diabetes for several years, and had had a severe endocarditis for some time. The third toe on the right foot had sloughed (Fig. 2).

The metatarsal bone of this toe was necrotic and extensively infected. The great toe and head of the metatarsal bone were gangrenous. The leukocyte count was 10,000; hemoglobin 50 per cent; temperature 99.8°; blood pressure 146/85. The patient came in for leg amputation.

The antiseptic wet pack was put on for forty-eight hours, and all necrotic tissue cut away. The wound was watched closely and healed well after six or seven weeks, with the exception of a slight area over the metatarsal bone of the great toe. On May 16, 1940, the wound was opened and most of the metatarsal bone cut away. The wound is now healed and a good functioning foot remains.

I am convinced that many legs are amputated that could be saved and made useful.

The control of diabetes is comparatively simple since the introduction of insulin. Many operative failures are due to uncontrolled infection. My own experience and that of those who have learned to use the large antiseptic wet pack properly, leads me to believe that this is the most efficacious means of controlling the infection.

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Discussion

Dr. John R. Paine: Seven or eight patients at the University Hospital have been injected in the manner indicated since the first of the year by Dr. R. Knight. These patients have been treated by Dr. William T. Peyton and myself as well as by Dr. Knight. I can only emphasize the striking benefits which Dr. Knight has mentioned which occasionally occur in these cases. In quite a number of instances, the pains which these patients complain of have been relieved after injection. Patients with involvement of the arm as well as the leg have been treated, and the results have been the same. The exact indications for the use of such injections, in my opinion, does not appear at the present time to be settled. Further time must elapse and more experience accumulated before anything can be said definitely on this point. We do know, however, that this is the most effective method of treatment we have for a patient with acute thrombophlebitis.

Dr. Ralph T. Knight presented a series of case reports illustrating the treatment of arterio-thrombosis and thrombophlebitis with lumbar sympathetic block.

BOWEL OBSTRUCTION IN PREGNANCY

Lawrence M. Larson, M.D., Ph.D. (in Surgery)
Minneapolis

At first thought it would seem that the continuity of the intestinal tract would be not infrequently interrupted when the uterus enlarges so tremendously as it does in the later months of pregnancy. The displacement of the bowel as well as of other organs is considerable, but because of the slow gradual process of this displacement and the constant movements of the intestinal tract, many compensatory adjustments are made. It is this factor which makes intestinal obstruction such a rare disease in pregnancy.

In over 66,000 deliveries at the Boston Lying-In Hospital from 1916 to 1938 there were sixty-one acute abdominal conditions requiring operation and only one of these represented a patient with intestinal obstruction, so that one can readily realize the rarity of this disease. The most common emergency of a surgical nature was acute appendicitis; next spontaneous rupture of the uterus; and finally tumors such as ovarian cysts or uterine fibroids. Gall-bladder disease occurred rather frequently but required operation in only three instances.

The diagnosis of bowel obstruction is usually a fairly easy matter. However, when this disease is present in pregnancy many difficulties present themselves which are not easy of solution. Furthermore, it is at this time that it is of greatest importance to make an early diagnosis if one is to obtain bests results in treatment of both the bowel condition and the pregnancy. These difficulties are due to the fact that both conditions present symptoms which may be so similar as to be confusing. In both pregnancy and bowel obstruction the presence of vomiting, abdominal pain and distention are to be expected. Furthermore, the presence of a large uterus prevents satisfactory palpation of the abdomen, which adds to the difficulties.

A very deceptive factor in pregnancy is the upward displacement of the abdominal viscera by the enlarging uterus. It is difficult to realize the tremendous change in position of the bowel which takes place when the entire lower abdomen becomes filled by the uterus. The ileocecal junction is usually pushed upwards close to the level of the gall bladder towards the end of pregnancy, and as one can readily determine, this will cause much confusion in diagnosis when an abdominal emergency occurs. Thinning of the abdominal muscles may be so great that muscle spasm cannot be elicited, and this is just another factor contributing to additional difficulties in making an early diagnosis of any abdominal emergency. Appendicitis, gall-bladder disease, peptic ulcer, right sided pyelitis and pleurisy may be almost undistinguishable as far as location of pain is concerned. At this point it may be well to insert that the location of the pain of appendicitis must be sought for at progressively higher levels as the months of pregnancy go by. Other conditions to be considered in

right sided pain are right salpingitis and tumors of the right adnexae, especially those of ovarian origin.

The symptom of vomiting as a rule is not confusing. Early in pregnancy regurgitation is common but it commonly stops by the end of the third or fourth months and with this type of vomiting the abdomen is usually flat and no areas of tenderness can be made out. If the vomiting continues longer than this, one should suspect an organic cause. Furthermore, if pain is an associated symptom, especially if persistent, the diagnosis should be the same as though pregnancy were not present.

During pregnancy severe acute abdominal pain may arise from diseases associated with the condition. This occurs with the rupture of a tubal gestation or if bleeding takes place within the uterus and the blood is retained there. Agonizing pain, shock, and collapse are a constant accompaniment. Late in pregnancy uterine rupture may be the cause of sudden abdominal pain, shock, and collapse.

Probably one of the most common causes of pain simulating intestinal obstruction results if the pedicle of an ovarian cyst or uterine fibroid becomes twisted. Frequently the symptoms of such an ailment begin as a mild attack of pain but occasionally they may be of a sudden severe character and in this type of case there is no question as to there being an acute abdominal emergency present. The diagnosis is established by palpation of the abdomen and recognition of a tumor separate from the uterus. Torsion of a pedunculated fibroid or even of a fibroid uterus itself is a much rarer condition. Another disease sometimes causing confusion with obstruction of the bowel is an infection in the genito-urinary tract. Just as in a non-pregnant woman it is entirely possible for this condition to closely simulate appendicitis. As we all know many appendices have been removed for this reason. The onset, however, is usually associated with a sudden rise of temperature, chills, tenderness and rigidity over the right lower abdomen and abdominal distention. This condition is most common on the right side and is somewhat rare on the left. The diagnosis rests upon urinary findings.

In general it should be emphasized that the principles of recognizing and handling an acute abdominal emergency during pregnancy are the same whether pregnancy is present or not. Furthermore it should be remembered that a differential diagnosis is not always possible. It is of the highest importance to above all recognize that an acute abdominal emergency exists and to manage the situation accordingly.

Case Report

This patient was first seen in September, 1937. She was twenty-four years of age and had always been healthy except for a previous appendectomy in 1932. When first seen she was beginning her eighth month in her first pregnancy which until that time was normal except for probably a little bit more than the usual amount of gaseous distention. She had had much morning sickness and indigestion the first three months of her pregnancy. However, this had improved greatly after that time and she was fairly well then until the onset of the present illness. For forty-eight hours she had had increasingly severe pain in her right abdomen and had vomited several times. She was prostrated from this intestinal upset. The pain came in cramplike waves and was definitely increasingly severe. She had had no bowel movement for about forty-eight hours although she had passed some gas until the past twenty-four hours. No other symptoms could be elicited. On physical examination she gave the appearance of a rather sick individual. Her face was drawn, she was pale and very weak. The temperature was 99.0°, pulse 108. A general examination was negative except for her abdomen. The uterus reached well above the umbilicus and was apparently normal. The position of the fetus could be determined as that of an occiput left anterior. There was a rather large amount of gaseous distention throughout the right half of the abdomen especially in the upper portion. She was quite tender over the appendectomy scar and upward to the lower rib margin. A diffuse rigidity and spasm was present involving the lower abdominal muscles which was slightly more marked on the right side. Auscultation revealed gurgling sound synchronous with the pain in the right side. Rectal examination was negative. The white blood count was 14,600 with a differential count of 92 per cent polymorphonuclears. The blood urea nitrogen was 34 milligrams per 100 c.c. of blood and the blood chlorides 526 milligrams per 100 c.c. of blood. An x-ray flat plate of the abdomen at this time showed the eight months' fetus but also demonstrated the typical parallel ladder-like arrangement of gas and liquid in the small bowel.

Laparotomy was decided upon and a right rectus incision made. A rather surprising condition presented itself when the ileocecal coil was found high on the right side almost up to the gall-bladder area. Moreover a thick fibrous band was present extending from the previous appendectomy scar up to the cecum and was under such tension that it had kinked the cecum enough to completely obstruct it. The bowel was not devitalized and after severing the band, all tension was removed and the kinked coil resumed its normal continuity. Convalescence was uneventful and five weeks later she gave birth to a normal child. Her labor was normal and no damage resulted to the abdominal incision. Examination six weeks post-partum revealed no hernia or weakness in the incision. The incision healed well enough to withstand the stress of a primiparous labor.

Several factors in this case are worthy of emphasis.

First of all, it is difficult to realize the tremendous displacement of abdominal contents, especially the bowel, occurring with the gradual rapid enlargement of the uterus which eventually fills the entire lower half of the abdominal cavity. This displacement tends to crowd the organs into the upper abdomen and adds to the difficulty in diagnosis, whenever any of them becomes subject to disease. This is an important point to remember when appendicitis is suspected, for one must seek the location of the pain at a higher level as the months of pregnancy go by.

Second, in bowel obstruction it is of greatest importance to make an early diagnosis and to consequently institute early therapy. In this particular case, if gangrene of the bowel had occurred, the consequences may have been very serious.

Third, this case again indicates the fact that operations of necessity can be carried out even in the late months of pregnancy.

Fourth, the principles of diagnosis and treatment of acute abdominal emergencies are the same in the pregnant woman as they are in the non-pregnant.



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OF GENERAL INTEREST

Dr. Irving H. Kiesling of Coleraine has been named a member of the Itasca County Welfare Board.

* * *

Dr. A. D. Mattson, a graduate of the University of Minnesota Medical School, has opened offices in Ulen.

* * *

Dr. Paul Stratte, who recently was graduated from Rush Medical School, Chicago, is assisting Dr. Anthony S. Berlin of Hallock.

* * *

Dr. Frederick A. Smith of Rochester is now on extended active duty at Walter Reed Hospital, Department of Anesthesia, in Washington, D. C.

* * *

Dr. G. I. Badeaux, who is associated with the Brainerd Clinic in Brainerd, recently took a week's postgraduate course at Cook County Hospital in Chicago.

* * *

Participating in the ninth annual postgraduate course given at the Indiana University School of Medicine in Indianapolis, April 28-May 2, was Dr. Walter M. Boothby of Rochester.

* * *

Physicians attending the Continuation Course in Obstetrics and Gynecology at the University of Minnesota last month honored Dr. Jennings C. Litzenberg, professor emeritus of obstetrics and gynecology, April 5, at a birthday party.

* * *

Dr. Andrew B. Rivers of Rochester presented a paper, "Recognition of the Complications of Peptic Ulcer and Their Medical Treatment," at the annual session of the Medical Association of the State of Alabama, April 15-17.

* * *

Dr. Jay Arthur Myers of Minneapolis addressed the Hudson County Medical Society in Jersey City, New Jersey, March 4, on the subject, "The General Practitioner's Part in the Program of the Prevention and Control of Tuberculosis."

* * *

Dr. Conrad I. Karleen, former resident of Tracy, has returned to that city to become associated in practice with Dr. W. H. Valentine. Dr. Karleen has been in Washington as surgeon at the Vancouver barracks.

* * *

Dr. William A. O'Brien, director of postgraduate medical education at the University of Minnesota, was in Billings, Montana, May 5, to address the annual spring clinic of the Yellowstone Valley Medical Society. He spoke on "Tumors of the Breast."

* * *

Dr. John A. Layne, who has been instructor in the department of medicine in the University of Minnesota Medical School for the past three years, will leave July 1 for Great Falls, Montana, where he will become associated with the Great Falls Clinic.

* * *

Dr. Horace Newhart, professor of otology, rhinology and laryngology at the University of Minnesota Medical School, discussed "Conservation of Hearing" before the Calhoun County Medical Society in Battle Creek, Michigan, March 4.

* * *

Recently released by publishers is a book by Dr. J. Arthur Myers of Minneapolis, entitled, "Man's Greatest Victory Over Tuberculosis." Dr. Myers is professor of medicine and preventive medicine and public health at the University of Minnesota Medical School.

* * *

Dr. John L. McKelvey, head of the department of obstetrics and gynecology at the University of Minnesota Medical School, presented a Mayo Foundation lecture in Rochester, April 10, on "Vascular Lesions in Pregnancy."

* * *

Dr. Curtis B. Nessa of St. Cloud, formerly on the University of Minnesota Hospitals' radiology staff, married Miss Gertrude Woldrick in Medicine Lake, April 19. Mrs. Nessa has been a laboratory technician at the University of Minnesota Hospitals and Eitel Hospital.

* * *

Dr. L. R. Critchfield of Saint Paul announces that he will have morning hours at 245 East Snelling Avenue, and afternoon hours at 429 Lowry Medical Arts Building for the practice of pediatrics. For a number of years Dr. Critchfield has been associated with the Saint Paul Clinic.

* * *

Dr. Ward Z. Flower of Minneapolis has returned to Gibbon to resume his medical practice. For the past twenty years, Dr. Flower has been practicing in Minneapolis. Dr. Flower began his medical practice in Gibbon in 1887 and has been practicing continuously since then.

* * *

When the third Louis A. Greensfelder Memorial Lectureship was presented at Michael Reese Hospital in Chicago, April 15, Dr. Owen H. Wangensteen, professor of surgery at the University of Minnesota Medical School, presented a paper on "Distention and Its Effect on the Bowel and Bodily Economy."

* * *

Dr. René J. Dubos of the Rockefeller Institute for Medical Research presented the annual Journal-Lancet Lectureship in the Medical Sciences Amphitheater under the auspices of the University of Minnesota Medical School, April 21. His subject was "Vulnerable Structures of the Bacterial Cell."

* * *

Dr. Herbert Boysen of Welcome has sold his practice and the Welcome Hospital to Dr. Charles F.

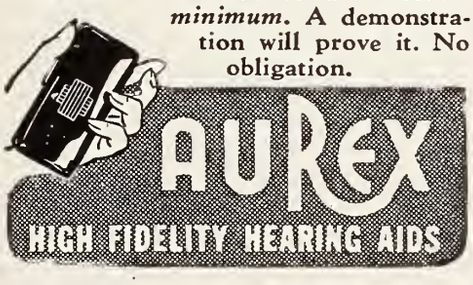
(Continued on Page 400)

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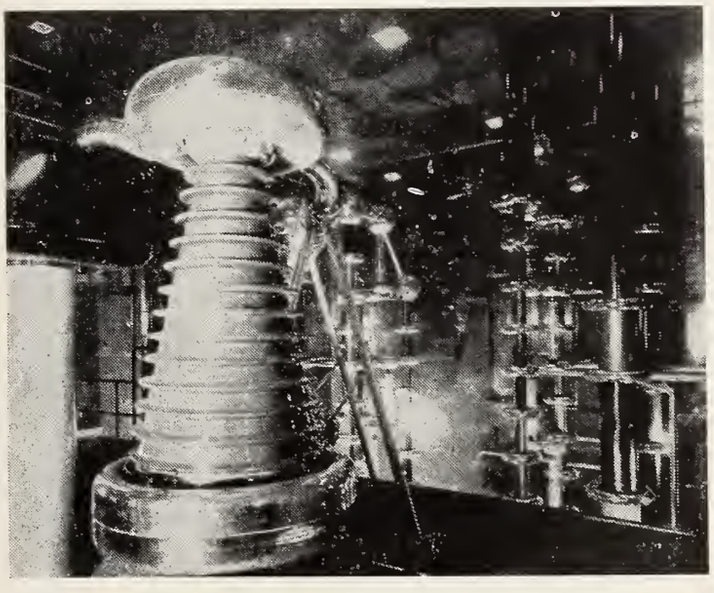
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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

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(*Continued from Page 398*)

Rosenberg of Shakopee. Dr. Boysen expects to take postgraduate work in surgery at the Cook County Graduate School of Medicine for two months, after which he will locate elsewhere.

* * *

Guest speakers at the annual meeting of the Medical Society of the State of New York, held in Buffalo, April 28 to May 1, included Dr. Frederick A. Willius of Rochester, whose subject was "Principles Underlying the Treatment and Management of Coronary Disease."

* * *

Dr. George W. Hauser, assistant football coach at the University of Minnesota, and Lloyd W. Stein, athletic trainer, have prepared a special motion picture to illustrate the prevention and treatment of athlete's injuries.

The film is available without charge to high schools upon request to the University of Minnesota.

* * *

Dr. Titus C. Kreuzer of Owatonna became associated with Dr. G. L. Jacquot of Marshall, May 1. A graduate of Marquette University Medical School in Milwaukee, Dr. Kreuzer was associated with the eye, ear, nose and throat clinic of Drs. Hovde, Smith and Meyers in Superior, Wisconsin, and with Dr. E. D. Risser of Winona before going to Owatonna.

* * *

Speakers at the twenty-sixth annual meeting of the Iowa Tuberculosis Association held in Des Moines, March 27-28, included Dr. Lewis S. Jordan of Granite Falls, Minnesota, who spoke on "Finding the Source and Breaking the Contact"; and Dr. Charles E. Lyght of Northfield, Minnesota, whose subject was "A Challenge to Iowa Colleges."

* * *

Dr. F. M. Feldman, former health officer of the Minnesota Department of Health district office in Mankato and more recently director of rural health, District 3, of the State Board of Health, with headquarters in Rochester, has been named health officer of the city of Rochester. He succeeds Dr. T. B. Magath who resigned that position.

* * *

In conjunction with the meeting of the American Medical Association in Cleveland next month, alumni of the University of Minnesota Medical School will hold an informal get-together at the Hotel Cleveland, June 4, from 5:30 to 7:30 p. m. Dr. Elizabeth Leggett of Kent, Ohio, is chairman of arrangements for the event.

* * *

John R. Anderson, son of Dr. and Mrs. Edward D. Anderson of Minneapolis, has been awarded a scholarship to the Curtis School of Music in Philadelphia and will go there to study next fall.

A student at the University of Minnesota, Mr. Anderson, baritone, was selected recently to sing with the Minneapolis Symphony orchestra at a concert, April 23.

Among the speakers at the annual assembly of the Nebraska State Medical Association in Lincoln, May 5-8, were Dr. Alexander E. Brown of Rochester, whose subject was "Practical Considerations in Sulfamido Therapy," and Dr. Albert V. Stoesser of Minneapolis who spoke on "Chemotherapy in Pneumonia" and "Preventive Allergy—A New Therapy."

* * *

Medical Reserve Officers whose orders have been revoked include:

Dr. Louis Alfred Benesh, first lieutenant, Minneapolis, who had been ordered to Fort Francis E. Warren, Wyoming.

Dr. Jacob Francis Karn, first lieutenant, Saint Paul, who had been assigned to Fort Knox, Kentucky.

* * *

Dr. Earl Cook Elkins of Rochester was in New York last month to address a meeting of the Eastern Section of the American Congress of Physical Therapy. His paper, written in collaboration with Dr. Charles Sheard, was entitled "The Effect of Infra-red Irradiation on Cutaneous Temperatures." While in New York he also attended a meeting of the editorial board of the *Archives of Physical Therapy.*

* * *

Dr. Walter C. Alvarez of Rochester was one of two physicians who presented a course in psychoneuroses in general practice, given April 21, by the committee on postgraduate education of the Medical Society of the District of Columbia, Washington. Dr. Alvarez also spoke at the eighty-fourth annual session of the Missouri State Medical Association held in St. Louis, April 28-30.

* * *

The Minneapolis branch of the Minnesota Society for the Control of Cancer held a luncheon meeting, April 4. Speakers included Dr. F. E. Harrington, health commissioner of Minneapolis; James H. Baker, executive secretary of the Hennepin County Medical Society; Dr. William A. O'Brien, president of the Minnesota Society; Dr. Norman Johnson and Dr. Edgar J. Huenekens of Minneapolis.

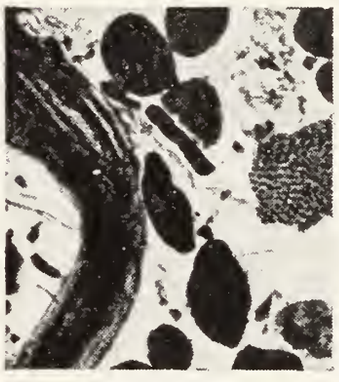
* * *

The marriage of Dr. Northrop Beach, medical fellow in pediatrics at University of Minnesota Hospitals, and Miss Caroline Wiggin of Portland, Maine, took place in Minneapolis, February 2. Dr. and Mrs. Beach are making their home at 515 Delaware Avenue, S. E., Minneapolis. Dr. Beach is the grandson of Dr. Cyrus Northrop, one-time president of the University of Minnesota.

* * *

Dr. H. I. Lillie of Rochester and Dr. Frank E. Burch, head of the Department of Ophthalmology and Otolaryngology at the University of Minnesota Medical School, presented several papers at the sixth annual Spring Postgraduate Course, sponsored by the University of Oregon Medical School and the Oregon Academy of Ophthalmology and Otolaryngology, in Portland, Oregon, March 31 to April 5.





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Dr. E. T. Bell, head of the department of pathology at the University of Minnesota Medical School, presented a paper on "The Disuse Atrophy of the Renal Arteries" at the meeting of the American Association of Pathologists in New York City, April 10 and 11.

Dr. Bell also attended the meeting of the American Association for Cancer Research in Chicago, April 15 and 16.

* * *

Dr. William R. Lovelace of Rochester was in Mexico City last month where he addressed, in Spanish, meetings of the Sociedad de Cirujia del Hospital General and of the Academia Nacional de Medicina. His subjects were "Malignant Lesions of the Cecum and Ascending Colon" and "I. Use of Oxygen in Surgery and Medicine; II. Recent Advances in High Altitude Flying."

* * *

When the fiftieth annual meeting of the Arizona State Medical Association was held in Phoenix, April 16-19, the guest speakers included two Rochester men: Dr. Henry F. Helmholz whose subject was "Blood Dyscrasias in Childhood," and Dr. John S. Lundy, "Supportive Measures Including Transfusion of Blood and Plasma, Parenteral Solutions and Stimulants."

* * *

Dr. Wesley W. Spink, assistant professor of medicine at the University of Minnesota Medical School, addressed a meeting of the American Association of Immunologists in Chicago, April 17. The subject of his talk was "The Effect of Ascorbic Acid upon the Bacteriostatic and Bactericidal Action of Human Blood."

On May 5, Dr. Spink addressed the American Society for Clinical Investigation at Atlantic City, New Jersey.

* * *

Applications of 122 students for admission to the freshman class of the University of Minnesota Medical School, for the fall quarter of 1941, have been accepted, according to Dr. C. D. Creevy, assistant dean of the Medical School. This is seven more than were accepted last year.

The committee on admissions is now entertaining applications for the fall quarter of 1942.

Enrollment in the Medical School is now approximately 550, including interns.

* * *

Dr. R. J. Wilkowske, practicing physician and surgeon in Owatonna since September 1, 1939, announces the opening of his own office at 120 West Bridge Street in Owatonna for the practice of medicine and surgery.

Before coming to Owatonna nineteen months ago, Dr. Wilkowske practiced in Nerstrand, Minnesota, for several years. He is a member of the staff of the Owatonna City Hospital and the St. Lucas Hospital in Faribault.

In the little more than four years that medical, hospital and public health continuation study courses have been offered at the University of Minnesota Center for Continuation Study, a total of eighty courses have been offered. These covered a period of 399 days. The faculty for the eighty courses included 1,837 persons, while attendance totaled 3,081. Fifty-nine of these courses were medical; nineteen were concerned with hospitals; and two, with public health.

* * *

Dr. Irvine McQuarrie, head of the department of pediatrics at the University of Minnesota Medical School, addressed a meeting of the Linn County Medical Society in Cedar Rapids, Iowa, April 10. His paper was entitled, "The 'Experiments of Nature' in Clinical Medicine."

On April 8, Dr. McQuarrie discussed his recent visit to China from a nutritional viewpoint, before a meeting of the Minnesota Industrial Chemists Forum in Minneapolis.

* * *

Dr. Ruth E. Boynton, director of the Student Health Service at the University of Minnesota and president of the American Student Health Service Association, was in New Orleans April 11 to address a meeting of the National Student Health Association, which is composed of student health service staff members in negro colleges. She spoke on the subject, "Educational Opportunities and Responsibilities of the Health Service."

On April 4, Dr. Boynton addressed the Ohio Student Health Association in Columbus, Ohio, on "Responsibilities of the Health Service for Student Housing."

* * *

The annual University of Minnesota Medical School banquet, sponsored by Incus, honorary medical society, was held April 23 at the Coffman Memorial Union. Dr. J. L. McKelvey, head of the department of obstetrics and gynecology, was toastmaster.

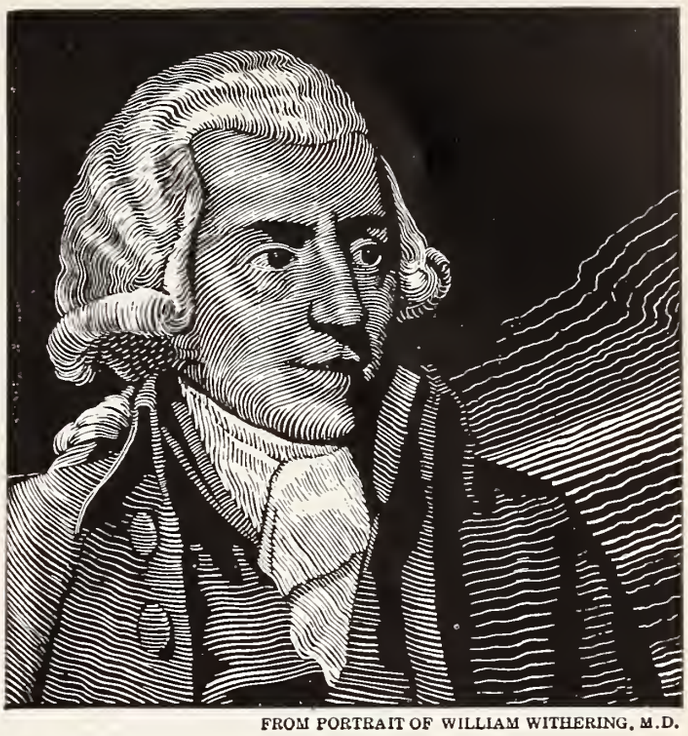
Speakers included Dr. E. T. Bell, professor and head of the department of pathology; Dr. B. C. Schiele, assistant professor of nervous and mental diseases; Dr. Moses Barron, professor of medicine; Dr. C. E. Rea, clinical assistant professor of surgery; and Dr. E. S. Platou, clinical associate professor of pediatrics.

* * *

A new course in sight conservation, planned especially for public health nurses but also open to medical school students, will be offered during the first summer session at the University of Minnesota this year.

It is being sponsored by the Minnesota Society for the Prevention of Blindness, the Minnesota Academy of Ophthalmology and Otolaryngology and the National Society for Prevention of Blindness.

The work will be offered under the direction of the University Department of Preventive Medicine and Public Health, headed by Dr. Gaylord D. Anderson. Miss Eleanor W. Mumford, representing the National Society for the Prevention of Blindness, will conduct the course.



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A series of radio programs has been presented by the Minnesota Hospital Association during April and May. These broadcasts, scheduled from April 14 through May 12, were concerned with various phases of hospital life and administration, such as: executive housekeeping, occupational therapy, hospital auxiliaries, medical and institutional library service, medical and social service, nervous and mental cases, x-ray and laboratory departments, development of the modern operating room, tuberculosis hospitals, medical records, nursing as a career. Dr. W. A. O'Brien was chairman of a round-table discussion on "The Part the Hospital Plays in the Community," April 25; and of another broadcast, over the North Central Broadcasting system, May 11.

* * *

In recognition of his receiving the John Scott Award of the city of Philadelphia and for other honors conferred upon him in the past, Dr. Owen H. Wangensteen, head of the department of surgery at the University of Minnesota Medical School, was honored by his fellows and former fellows at a party at the Minneapolis Club, April 2.

Thirty-five persons were present including Dr. Charles Mead of Duluth, Dr. James Hibbard of Wichita, Kansas, Dr. Leslie Tasche of Sheboygan, Wisconsin, and Dr. Ray Buirge of New Hampton, Iowa.

Dr. George Eitel was toastmaster, Dr. O. J. Campbell presented Dr. Wangensteen with a scroll signed by all the fellows, and each fellow related one outstanding experience while on service. There were many telegrams from persons unable to be present.

* * *

The Women's Field Army, affiliated with the Minnesota Society for the Control of Cancer, conducted a membership drive last month. Mrs. Harlow Hanson of Minneapolis is commander of the field army, and directed the drive. Funds will be used entirely for educational purposes.

Several physicians recently addressed meetings under the auspices of the Women's Field Army. Among those giving these talks on cancer were: Dr. James Dunn of Saint Paul who addressed the Vocational Hospital Alumnæ in Minneapolis, March 19; Dr. Charles Craft of the University of Minnesota Hospitals, who spoke before the Hector, Minnesota, High School and the Women's Club, March 25; and Dr. William A. O'Brien, president of the Minnesota Society for the Control of Cancer, who addressed the Nicollet-LeSueur County Medical Auxiliary at St. Peter, April 15.

* * *

To avert a possible national shortage of doctors, the Selective Service System has ordered deferment of military training for medical students who "give reasonable promise of becoming acceptable medical doctors."

A memorandum from Brigadier General Lewis B. Hershey, selected service deputy director, instructs state and local boards to continue such deferments as long

as the students progress satisfactorily. Local boards are also urged to make sure that requirements of the armed forces for physicians and surgeons are filled, without summoning to military duty practicing doctors whose services are necessary to the community.

It is estimated that there is a need for 9,000 medical officers for the Army, Navy, Public Health Service and Veterans Administration. To fill that need would remove about 5 per cent of the doctors now engaged in civilian practice.

* * *

Medical Reserve officers ordered to extended active duty within the past few weeks include:

Dr. Leonard K. Buzzelle, first lieutenant, Minneapolis, assigned to Camp Joseph T. Robinson, Arkansas.
Dr. Malcolm R. Johnson, captain, Red Wing, to Fort Riley, Kansas.
Dr. Edward John Low, first lieutenant, Mahnomen, to Fort Sam Houston, Texas.
Dr. Kenneth Eben Bray, first lieutenant, Park Rapids, to Fort Knox, Kentucky.
Dr. Nesmith Perry Nelson, captain, Brainerd, to Fort Knox.
Dr. Arthur Neumaier, first lieutenant, Lindstrom, to Fort Knox.
Dr. William Martin O'Brien, captain, Saint Paul to Fort Knox.
Dr. Everett Charles Perlman, captain, Minneapolis, to Fort Knox.
Dr. Harry Louis Plotke, first lieutenant, Little Falls, to Fort Meade, South Dakota.
Dr. Carl Walter Rumpf, captain, Faribault, to Fort Knox.
Dr. Paul A Swedenburg, captain, Swanville, to Fort Knox.
Dr. Floyd Ammann Thompson, captain, Saint Paul, to Fort Knox.
Dr. Robert Johnson Cairns, first lieutenant, Sanborn, to Camp Joseph T. Robinson, Arkansas.
Dr. George John Halladay, first lieutenant, Brainerd, to Camp Joseph T. Robinson.
Dr. James Frederick Shandorf, first lieutenant, Northfield, to Camp Joseph T. Robinson.
Dr. Edwin Gerhardt Trytten, first lieutenant, Middle River, to Camp Joseph T. Robinson.
Dr. Clifford Orvis Erickson, first lieutenant, Rochester, to induction station, Fort Snelling, Minnesota.
Dr. Raymond Paul Hawkinson, captain, Robbinsdale, to induction station, Fort Leavenworth, Kansas.

* * *

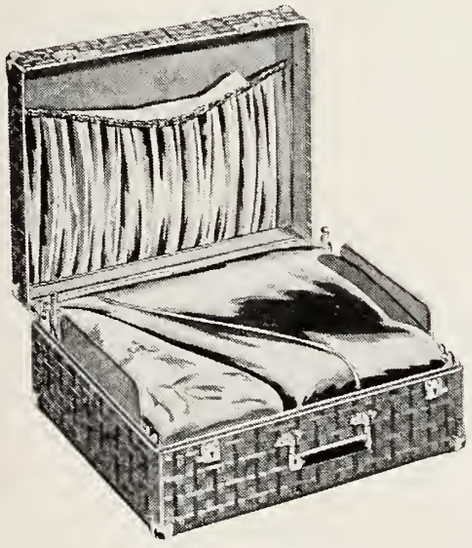
Dr. William Richardson Bagley, pioneer Duluth physician, has been selected as the seventeenth member of the Duluth Hall of Fame. Announcement of his selection as Duluth's "First Citizen" for 1940 was made at the seventeenth annual Hall of Fame dinner, March 29. The gathering, attended by 800 persons, including prominent Minnesota and Wisconsin state officers and leading Legionnaires, was addressed by Milo J. Warner, national commander of the American Legion.

In making the award, Dr. Bagley's work last year in the Duluth, state and national Izaak Walton leagues, his service as a member of the board of directors of the Chamber of Commerce, and his community leadership as president of the Rotary club, were cited. Recognition was also given Dr. Bagley for his active participation in the civic life of Duluth during his long period of residence in Duluth and for his forty years of medical practice.

Forrest C. Huyck, chairman of the Hall of Fame committee of Wisted Legion post, presented Dr. Bagley with the Legion plaque, emblematic of his membership in this "immortal body." Later Dr. Bagley's picture will be hung in the Hall of Fame corridor in the City Hall.

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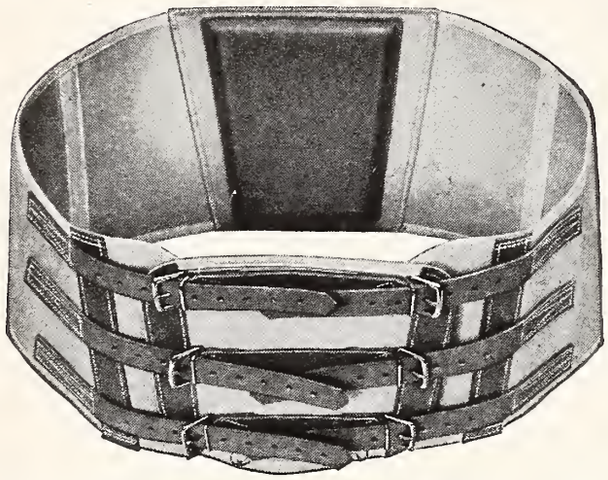
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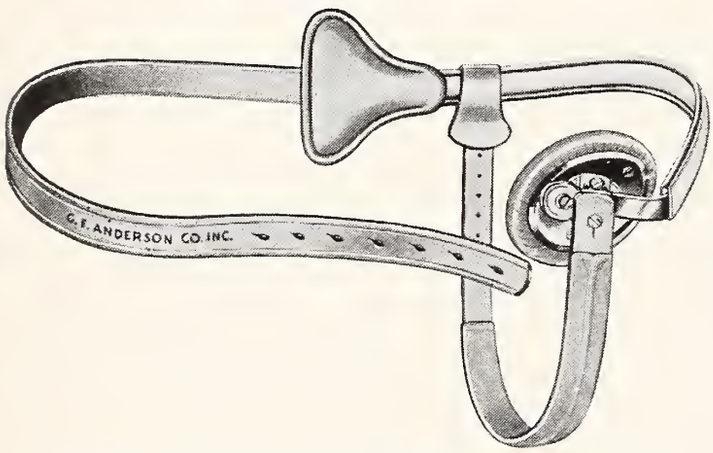
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U. S. GENERAL HOSPITAL UNIT NO. 26

Dr. L. Haynes Fowler of Minneapolis has been named unit director of the United States General Hospital Unit No. 26 at the University of Minnesota, an inactive unit which will mobilize and become available for any theater of operation in event of a national emergency.

One of several such units organized in the United States in the interest of national preparedness, this hospital unit has been formed under the direction of Dr. H. S. Diehl, Dean of Medical Sciences. Requisite for membership is affiliation with the University of Minnesota and acceptance in the Medical Reserve Corps of the United States Army after recommendation by the organizing committee. Any medical men desiring affiliation with the unit should make application to Dr. Diehl or the unit director, Dr. Fowler.

Heading the various services are: Dr. Joseph Borg, medical service; Dr. Fowler, surgical service; Dr. Gerald T. Evans, laboratory service; Dr. Earl W. Nelson, dental; and Dr. Oscar Lipschultz, x-ray service. Major Robert N. Barr is detachment commander.

The complete personnel of the unit, as it is now constituted, follows:

Administrative Personnel

Detachment Commander: Major Robert N. Barr
Mess Officer: Major Reuben Erickson
Receiving Officer: Gordon C. MacRae
Captains: Richard H. Barnes, Lyle J. Hay, Robert C. Schenk
First Lieutenant: Lyle French
Second Lieutenants: Norman O. Holte and Dale D. Shepard

Medical Service

Chief of Service: Lt. Colonel Joseph Borg
Assistant Chief of Service: Major Royal C. Gray
Majors: A. B. Baker, Douglas Head, Philip Hallock, and Sam Weisman
Captains: T. J. Bulinski, Robert K. Grau, W. H. Hollinshead, Robert Johnson, Russell C. Lindgren, Stanley W. Lundblad, Robert Meller, Lawrence M. Nelson, Charles Polan, and Karl d'Andresen.
First Lieutenants: David Craig, D. W. Hilger, LaVern C. Strough, Rodney F. Sturley, Evrel Larson, and John Haserick.

Surgical Service

Chief of Service: Lt. Colonel L. Haynes Fowler, and Unit Director.
Assistant Chief of Service: Major John R. Paine
Majors: Edward T. Evans, Charles E. Rea, Jerome A. Hilger, Logan Leven, and Wallace Ritchie.
Captains: George Bergh, Kenneth E. Fritzell, Meyer Z. Goldner, Baxter Smith, Louis Sperling, Karl E. Sandt, Theodore L. Stebbins, Leonard Titrud, and Conrad Holmberg.
First Lieutenants: Carroll Bellis, Harry Hall, and Herman Koschnitzke.

Laboratory Service

Chief of Service: Major Gerald T. Evans
Captain: Robert Hoebbels
First Lieutenant: Milton Levine

Dental Service

Chief of Service: Major Earle W. Nelson
Captain: Harold G. Worman
First Lieutenants: Lyle A. Brecht, Anthony J. Scholtis, and John F. Tenney.

X-ray Service

Chief of Service: Oscar Lipschultz
Captain: Jack Chalek

In Memoriam

Russell Stewart Bacon

Dr. R. S. Bacon, a resident of Montevideo, Minnesota, for over fifty years, died March 29, 1941 at the age of eighty-one.

Dr. Bacon was born May 28, 1859 at Elroy, Wisconsin. His mother died when he was four years of age and when he was eight he lost his father. From that time on he made his own way with the help of friends of the family.

He graduated from the Mauston, Wisconsin high school in 1880 and received his medical degree from Rush Medical College, Chicago, in 1885. He worked his way through medical school teaching and working on a street car line in Chicago. Postgraduate work was taken later at New York University and Tulane University.

In 1886 Dr. Bacon settled at Dawson. He was located at Appleton from 1887 to 1889 when he moved to Montevideo.

Dr. Bacon was active in the early development of his community. He had been an active Mason since 1889 and a Knights Templar since 1890. He had long been a member of the Camp Release District Medical Society, the Minnesota State and American Medical Associations. He maintained his office until last September.

Dr. Bacon served on the draft board during the World War, was a member of the Montevideo school board from 1909 until 1919, was secretary of the United States Pension Board from 1890 until 1929 and was on the Board of Directors of the Riverside Sanatorium from 1917 to 1937. Though an Episcopalian he attended the Congregational Church of Montevideo.

In 1893 Dr. Bacon married Alice Gallinger at Cottage Grove. Two sons, Arthur R. Bacon of Montevideo, and Guy S. Bacon of Cottonwood, survive.

Joseph Franklin Bond

Dr. J. F. Bond, Wabasha, Minnesota, died March 27, 1941, from coronary thrombosis in his eightieth year.

Dr. Bond was born in Versailles, Illinois, July 21, 1861. Graduating from Rush Medical School in 1885 he located in Scott County Kansas. In 1897 he married Harriet Riley and moved to Wabasha where he remained until the time of his death.

At one time Dr. Bond served as city physician and was a member of the library board. He became a member of the Wabasha County Medical Society in 1901 and served as president in 1902-1903. In recent years he was an honorary member of the society.

Dr. Bond was ever alert to the best interests of his profession and in the early days did much for Saint Elizabeth's Hospital in the formative period of that institution.

Mrs. Bond died in Wabasha in 1933. A sister, Mrs. J. Gaut of Versailles, Illinois, survives.



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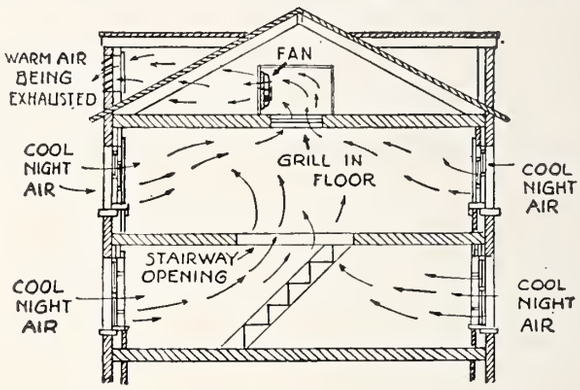
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IN MEMORIAM

(Continued from Page 407)

Griffith Moses Jones

Dr. G. M. Jones, Minneapolis, died April 16, 1941 at the home of his daughter, Mrs. T. C. Morris, at Petersburg, Virginia.

Dr. Jones was born in Wales, April 25, 1870 and came to this country as a young man. He received his preliminary education at Redfeld College in South Dakota and at Ripon College in Wisconsin. He received his M.D. at the University of Illinois College of Medicine in 1905 and interned at Saint Joseph's Hospital in Saint Paul.

Dr. Jones practiced in Cambria, Wisconsin from 1905 until 1909. He took postgraduate work at Long Island College Hospital, New York, and at the Children's Memorial Hospital in Chicago, and specialized in pediatrics.

Dr. Jones was an Elder in the Welch Presbyterian Church of Minneapolis. He was a member of the Masonic Lodge and of the Hennepin County Medical Society, the Minnesota State and American Medical Associations.

John Knotz

Dr. John Knotz, Cologne, Minnesota, died on March 3, 1941, at the age of sixty-eight.

Dr. Knotz was born in Austria, September 10, 1872. When ten years old he came with his family to Minneapolis. He received his early education in Saint Joseph's School in Minneapolis and graduated from the medical department of Hamline University in 1897.

Dr. Knotz was married to Rosa Partoll on August 16, 1897 in Minneapolis. After a short time spent in South Dakota he moved to Cologne where he carried on an extensive practice for forty-three years.

Communication

Tricks and Devices of Narcotic Drug Addicts

At the request of Dr. L. L. Sogge, chairman of the Committee on Public Policy, Minnesota State Medical Association, the following information concerning tricks and devices of narcotic drug addicts has been submitted for publication by Harry D. Smith, District Supervisor of the Bureau of Narcotics.

The last eighteen months of changing world conditions has had a marked effect on the narcotic situation, as a result of which illicit supplies have practically disappeared in some localities and become increasingly scarcer in others. There has been a tremendous increase in the efforts made by addicts to obtain narcotics by illegal means from legitimate sources, these efforts ranging from the burglary of wholesale and retail drug stores to ordinary thefts, fraud and deceit, forgery of prescriptions and well simulated symptoms of physical suffering incident to various ailments.

In numerous instances a single individual of either sex has used many aliases and obtained prescriptions from separate physicians within a comparatively short period, and particularly is this true in the rural districts where several physicians in different towns have been visited by such persons using different names (aliases) the same day, and by this means succeeded

in accumulating sufficient morphine for their own comfort and a supply for resale.

Discussions with many physicians have disclosed that while they were acting in good faith, they had in many instances furnished prescriptions or dispensed narcotics practically upon request, often without any medical examination and even without seeing the patient.

The situation from the addiction standpoint is really serious, while the necessity for the conservation of narcotics is of the utmost importance, and I am outlining a number of points in relation to which your coöperation and that of the members of the medical profession would be most useful.

Complaints are frequently heard from pharmacists that many physicians insist upon "telephoning in" their narcotic prescriptions to drug stores and want them filled before the written order is in the druggist's hands. If the druggist fills such a telephonic order, he commits an offense under the Federal Narcotic Law.

Equally specific complaints have been made that certain physicians, upon being informed by the druggist that telephoned prescriptions could not legally be filled, have not hesitated to threaten such druggists that they would send their business elsewhere if their telephoned prescriptions were refused. I am sure that the physician would not desire to place the druggist in the position of violating the law and that this reference to the matter will tend to end such practices.

The following points are suggested as worthy of consideration by the members of your profession in connection with efforts to conserve the narcotics in the United States by restricting their use to legitimate medical purposes only.

1. Always sign and date a prescription for narcotics or preparations containing same, and do not ask the druggist to fill it until he has received and examined it. The druggist has no option, and any variation may result in trouble.

2. Do not issue narcotic prescriptions without making an examination sufficient to satisfy yourself that the narcotic is necessary for purposes other than to satisfy addiction.

3. Narcotic prescriptions should not be issued to a third party who endeavors to obtain one for a "patient" unknown and whose symptoms are described but who is not present.

4. Look with particular suspicion upon requests for prescriptions consisting of Laudanum and Olive Oil. Many of these have been issued to addicts who invariably separate the opiate from the oil and use the former hypodermically.

5. Be extremely cautious in furnishing narcotic drugs to any person on representation that he is in a traveling status enroute to some distant institution for treatment of narcotic addiction. Carefully safeguard against being deceived by transient addicts simulating pain ordinarily recognized incident to acute attacks of certain chronic conditions, and particularly is this suggestion advisable where the unknown individual suggests a narcotic as the only relief possible.

6. Be on the alert against the addict who attempts to secure a narcotic by promises to submit to hospitalization at a later date.

The tricks of addicts are so many that it would be difficult to enumerate them herein, and with the thought in mind that this circular is informative only, I trust that the mutual efforts of the doctor, druggist, and this Bureau may keep at a minimum the amount of drugs available to the illicit narcotic traffic.



MEDICAL BROADCAST FOR MAY

The Minnesota State Medical Association broadcasts weekly at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota.

May 3—Summer Round-up
May 10—The Community Hospital
May 17—Maternal Hygiene
May 24—Better Health for Babies
May 31—Care of Children's Teeth

COURSE IN ROENTGEN DIAGNOSIS OF NON-TUBERCULOUS DISEASES OF THE LUNGS AND PLEURA

A study course in Roentgen Diagnosis of Non-tuberculous Diseases of the Lungs and Pleura will be offered at the University of Minnesota Center for Continuation Study, May 22, 23 and 24, it is announced by Dr. William A. O'Brien, director of postgraduate medical education. Enrollment is limited to physicians with special training in radiology.

MINNESOTA PATHOLOGICAL SOCIETY

Dr. Irvine McQuarrie, head of the pediatrics department at the University of Minnesota, will give The President's Address at the meeting of The Minnesota Pathological Society, May 13. His subject will be "The 'Experiments of Nature' and Clinical Investigation."

UNIVERSITY MEDICAL ALUMNI ASSOCIATION

The annual banquet of the University of Minnesota Medical Alumni Association, which will be a feature of the Minnesota State Medical Association meeting next month, will be in the form of a buffet supper to be held at the Casino in the Saint Paul Hotel, Monday, May 26, at 6 p. m.

Following the supper, Clifton M. Utley, director of the Chicago Council on Foreign Relations, will address the group on "America in a World at War." Mr. Utley, an authority on foreign affairs, has participated many times in the University of Chicago round-table discussions which are a Sunday evening radio feature.

All physicians attending the state meeting are invited to the supper, arrangements for which are being



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made by Dr. Gordon R. Kamman of Saint Paul. Dr. Francis W. Lynch of Saint Paul is president of the Medical Alumni Association.

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The annual meeting of the American Association for the Study of Goiter will be held at the Hotel Statler in Boston, Massachusetts, May 12, 13 and 14.

The program for the three-day meeting will consist of papers dealing with goiter and other diseases of the thyroid gland, dry clinics and demonstrations.

MINNESOTA HOSPITAL ASSOCIATION

The state convention of the Minnesota Hospital Association will be held May 22, 23 and 24 at the Hotel Lowry in Saint Paul.

The first general session will be called to order at 2 p. m., May 22. Speaker at the supper that evening will be J. H. Norby of the Columbia Hospital in Milwaukee.

Highlights of the program May 23 will be a round table discussion in the afternoon led by James J. Drummond of Rochester, and the convention banquet.

Saturday, May 21, Dr. A. C. Bachmeyer of the University Clinics, University of Chicago; Ada Belle McCleery of Evanston, a trustee of the American Hospital Association; and Dr. M. T. MacEachern of the American College of Surgeons, Chicago, will address the final general session. Paul Fesler, who has made a survey of hospital facilities in Minnesota, will present a report on "Minnesota Hospitals in National Defense."

At this convention, Ray Amberg of the University of Minnesota Hospitals retires from the presidency, and Miss Esther Wolfe, president-elect, succeeds him.

SCOTT-CARVER MEDICAL SOCIETY

Dr. Henry Ulrich of Minneapolis presented several cases of "Retroperitoneal Tumors" and Dr. Thomas Lowry, also of Minneapolis, talked on "Lung Abscess," at the regular monthly meeting of the Scott-Carver County Medical Society, April 8, at the new Nagel Hospital in Waconia. Opened last October, the Nagel Hospital has a capacity of twenty beds and four bassinets. The one-and-a-half-story building is fireproof and has all modern equipment including x-ray deep therapy. It has its own emergency line power plant. Dr. H. D. Nagel of Waconia is chief of staff.

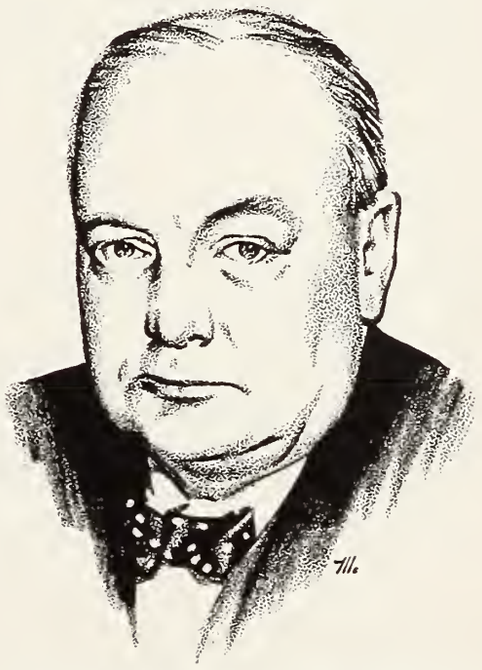
WASHINGTON COUNTY MEDICAL SOCIETY

At the regular monthly meeting of the Washington County Medical Society, held April 8, at the Stillwater club rooms, Dr. Frank Adair of Saint Paul was the guest speaker. His subject was "Manifestations of Vitamin B Complex Deficiencies."

A bill, Senate File 1034, for regulating ambulance service was brought before the meeting, and the

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county society's legislative committee strongly recommended its passage.

Visitors at the meeting included Dr. Carl L. Larsen of Saint Paul; Dr. Frank Giles and Dr. H. Kennelly, medical officer at the Bayport CCC Camp.

OBSTETRIC COURSES

The Illinois State Department of Public Health and the Children's Bureau, U. S. Department of Labor, are sponsoring ten 4-week courses in obstetrics at the Chicago Lying-in Hospital during the fiscal year 1941-1942. Only a limited number of physicians will be accepted for each course. The only cost to the individual is for room and board and $25.00 ($10.00 of which is refunded at the completion of the course). Applications and inquiries should be addressed to: Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue, Chicago, Illinois.

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This is the *Last Call* for reservations for the *Nineteenth Annual Convention* of the Woman's Auxiliary of the American Medical Association which will be held at Hotel Carter in Cleveland, June 2-6. All Cleveland extends a hearty welcome to you.

Princeton, Minnesota was the meeting place, March 28, for the members of the *East Central Medical Auxiliary*. An interesting talk was given by Mrs. T. M. Olsen of Elk River, District Commander of the Women's Field Army for the Control of Cancer. The Auxiliary pledged its support in the coming drive. Newly elected officers for the year are: Mrs. A. B. Roehlke, Elk River president; Mrs. Williard Nordman, Mora, vice president; Mrs. L. H. Hedenstrom, Cambridge, secretary and treasurer. Mrs. Gordon H. Tesch, Elk River, was named publicity chairman.

Hennepin County Auxiliary gave its annual post-Easter party Monday, April 14. Mrs. L. R. Boies was chairman with Mrs. R. S. Ylvisaker co-chairman. The following members, representing various districts in the city, acted as chairmen for the various parties: Mrs. C. W. Pollard, Mrs. L. F. Richdorf, Arthur La Pierre, J. G. Davis, C. W. Laymon, J. B. Carey, Rollo Stewart, P. E. Petersen, Reuben Erickson, Milton Seifert, James Blake Jr., Archie Smith, G. M. Koepcke, Joseph Neal, W. K. Haven, A. H. McFarland, L. R. Scherer, J. H. Moe, J. H. Simms, Frank Bryant, Ernest R. Anderson, R. R. Sullivan, J. C. Hultkrans, W. R. Jones, J. K. Moen and L. J. Leonard.

Mower County Auxiliary met March 24 in Austin at the home of Mrs. H. B. Allen. A dessert luncheon was served at one o'clock. Several articles from the *Women's Auxiliary Bulletin* were read by Mrs. Carl Eckhardt. Mrs. C. C. Allen, chairman of the Public Relations Committee, explained the project of a survey of women's health interests to be conducted in this county.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

Books Received for Review

The Mask of Sanity. Hervy Cleckley, B.S., B.A. (Oxon.), M.F. Professor of Neuropsychiatry, University of Georgia School of Medicine, Augusta, Ga. 298 pages. Price, $3.00, cloth. St. Louis: C. V. Mosby Co., 1941.

The Essentials of Applied Medical Laboratory Technic, J. M. Feder, M.D. Director of Laboratories and Allergic Service, Anderson County Hospital, Anderson, S. Car. 241 pages. Illus. Price $5.00, cloth. Charlotte, N. Car.; Charlotte Medical Press, 1940.

Essentials of Dermatology. Norman Tobias, M.D., Senior Instructor in Dermatology, St. Louis University; Assistant Dermatologist, Firmin Desloge and St. Mary's Hospitals; Visiting Dermatologist St. Louis City Sanitarium and Isolation Hospital. 497 pages. Illus. Price, $4.75, cloth. Philadelphia: J. B. Lippincott Co., 1941.

Hemorrhagic Diseases. Photo-Electric Study of Blood Coagulability. Kaare K. Nygaard, M.D. Former Fellow in Surgery, Mayo Foundation; Former Assistant Surgeon, University Clinic, Oslo; Fellow of Alexander Malthe Foundation for research in Medicine, Surgery and Gynecology. 320 pages. Illus. Price, $5.50, cloth. St. Louis; C. V. Mosby Co., 1941.

Introduction to Psychobiology and Psychiatry. A Textbook for Nurses. Esther Loring Richards, M.D., Sc.D. Associate Professor of Psychiatry, Johns Hopkins University; Physician-in-charge of Outpatient Department, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital; Psychiatrist-in-chief, Baltimore City Hospitals. 357 pages. Price, $2.50, cloth. St. Louis: C. V. Mosby Co., 1941.

First Aid in Emergencies. Tenth Edition. Eldridge L. Eliason, A.B., M.D., Sc.D., F.A.C.S. Professor of Surgery, University of Pennsylvania School of Medicine; Professor of Surgery, University of Pennsylvania Graduate School of Medicine; Surgeon, University of Pennsylvania, Presbyterian and Philadelphia General Hospitals. 260 pages. Illus. Price, $1.75, flexible binding. Philadelphia: J. B. Lippincott Co., 1941.

Help Your Doctor to Help You. A Series of Medical Books for Laymen. The first five books published cover the subjects of: Sick Headache or Migraine, Gastric or Duodenal Ulcer, Gallstones and Disease of the Gall Bladder, Colitis, and Food Allergy. Editorial Board headed by Dr. Walter C. Alvarez, and including Dr. Logan Clendening, Dr. Howard W. Haggard and Dr. Charles W. Mayo. Cloth bound, 95c each. New York: Harper & Brothers, 1941.

The Heart in Pregnancy and the Childbearing Age. Burton E. Hamilton, M.D., Cardiologist, Boston Lying-In Hospital; and K. Jefferson Thomson, M.D., Associate Physician, Metropolitan Life Insurance Co. Sanatorium, Mt. McGregor, New York; Research Associate in Medicine Albany Medical College; formerly Research Fellow in Obstetrics, Harvard Medical School; formerly Instructor

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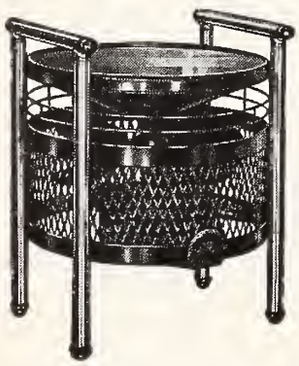


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in Medicine, Cornell University Medical College. 402 pages. Illus. Price, $5.00, cloth. Boston: Little, Brown & Co., 1941.

CARDIAC CLASSICS. A Collection of Classic Works on the Heart and Circulation with Comprehensive Biographic Accounts of the Authors. Fifty-two contributions by fifty-one authors. Frederick A. Willius, M.D., M.S. in Med. Chief, Section on Cardiology, Mayo Clinic; Professor of Medicine, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota; and Thomas E. Keys, A.B., M.A. Reference Librarian, Mayo Clinic; formerly Carnegie Fellow, Graduate Library School, University of Chicago. 858 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1941.

PRECLINICAL MEDICINE; preclinical states and prevention of disease. MALFORD W. THEWLIS, M.D. Baltimore; Williams and Wilkins, 1939. $3.00. 223 pages.

In this concise book the author has succeeded in outlining the more important considerations having to do with a very early approach to disease prevention. A foundation is laid for the study of the very early deviations in the human mechanism which may lead to definite clinical disease at a later period.

The opportunity as well as the responsibility of the family physician in recognizing preclinical leads is emphasized. Such factors as disease soils, conditioning periods, and individual vulnerability, are stressed. The author presents outlines which the interested practitioners may follow in accumulating and evaluating the material he obtains. This material information may be used to arrive at a so-called synthetic diagnosis.

Stress is laid on the fact that the study of preclinical medicine and the prodromal period of actual clinical disease are not the same phases of disease.

There are brief references to the various systems and some discussion is presented of the recognition of preclinical signs in the individual.

The book is compact, clearly written and one should find interest in its content as well as inspiration in the possibilities offered.

L. R. CRITCHFIELD, M.D.

SCIENCE AND SEIZURES—NEW LIGHT ON EPILEPSY AND MIGRAINE. Wm. G. Lennox, M. D., Associate Professor of Neurology, Medical School, Harvard University. 239 pages. $2.00. Harper Brothers, 1941.

It is unusual that an outstanding scientist such as Dr. Lennox produces as readable, understandable, and yet so sound a book as this on so complicated a topic. It has been written for the benefit of the parents or relatives of the convulsive group, but is equally valuable for the orientation of the general physician who does not care to delve too deeply into the more complex aspects of these disorders. The historical background of the fears and superstitions that have long surrounded the dreaded epilepsy are reviewed and dispelled so that

convulsive attacks emerge on a social level of acceptance akin to tuberculosis and cancer.

Dr. Lennox, in his recent research, has brought much additional light on the origin of the convulsive attacks through his studies with the electro-encephalogram. These are carefully described in this work. His section on the importance of psychological factors and their influence on the frequency of the attacks is admirably presented. The discussion of the various types of drug therapy is valuable. His comments on the social, industrial, and hereditary aspects of convulsive attacks and the responsibilities they place on the patient and his family are frank and level-headed.

The second section devoted to a discussion of "headache seizures," or migraine, presents some thought-provoking material that is of great significance.

This book is one that any physician who has in his practice one or more patients with convulsive attacks in families of average intellectual capacity would find most useful in gaining their coöperation and understanding and thereby ease his own responsibility. The royalties from the sale of this book, Dr. Lennox states in his introduction, will be devoted to furthering the much-needed research in the field of convulsive disorders.

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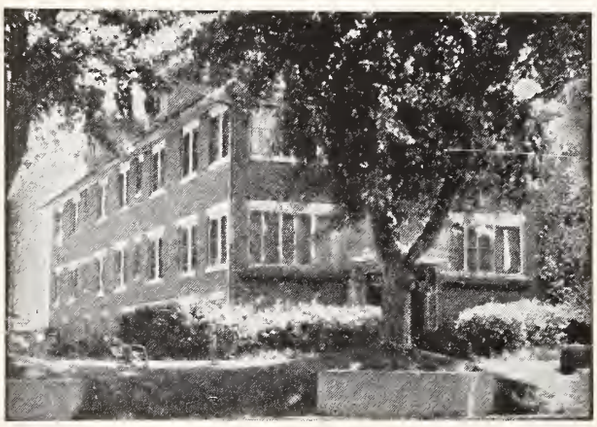
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GYNECOLOGICAL MALIGNANT DISEASE*
Some Problems in Treatment

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THE object of this paper is to discuss some of the problems which are met in the handling of gynecological malignant disease. These are not only problems related to the diagnosis and handling of specific neoplasms but are often problems of a general nature which are shared by those who handle malignant disease elsewhere in the body. It would seem wise to establish before a group such as the members of the Clinical Club at least the development of the attitudes of the gynecological group toward these problems.

Certain facts should be clearly stated at the outset in order that later confusion may be avoided. In the first place, while a few broad general principles are applicable to the tumor problem as a whole, these must always be qualified when applied to specific tumors. It requires no further argument to establish the fact that each tumor type is a distinct entity and that variations in natural history and the diagnostic and therapeutic problems are so great that attempts to apply general principles from one to another are not well based. A clear and precise knowledge of the available information in regard to any individual tumor is a sine qua non for its adequate handling.

The second important point to be made will perhaps strike you as absurd. It may seem strange that accuracy should be demanded in the handling of a disease condition about which so little of a fundamental biological nature is known and where therapeutic failure reaches such magnitude. Very considerable degrees of skill and experience are required for diagnosis and in the carrying out of either radiological or surgical therapy of malignant disease. In all of these fields carelessness or unwarranted pretense of authority leads on to serious disaster from which there is likely to be no returning. It is quite clear that the first attack in the matter of histological diagnosis and surgical or radiological therapy is all important. Chance for subsequent fruitful correction of errors in these fields is almost hopeless. For the most part, the surgical technics in the tumor field are delicate and extensive. The radiological attack involves working in a narrow range beyond which too little or too much are equally disastrous. The results of second attempts with either radiation or operation are too well known to require further discussion. The intelligent individual working in this field will develop a serious sense of humility and an earnest desire for accuracy and constant vigilance. He may perhaps be pardoned for some lack of tolerance for the ill-equipped amateur who goes blithely on his way "where angels fear to tread."

The third point which might be made at the outset has to do with an all too wide acceptance of the principle that control of the tumor patient can be efficiently divided into three separate and distinct divisions. There is no reasonable justification for the radiologist, the clinician and the pathologist each ignoring the others' fields. The ultmate ends of our struggle are the welfare of the patient and the progression of knowledge. Both of these are served by a constant check of one group on the other and the sharing of problems and information. It is one's opinion that efficiency is not complete until each group

*Presented before the Minneapolis Clinical Club, December, 1940.

is able and willing to accurately and critically evaluate the problems of the other two. It might be pointed out that those in the three groups who work with gynecological tumors have rather by accident than by design, progressed further in this direction than those in most but not all other fields. This is probably due to two fortuitous circumstances. The German school has until recently led modern gynecological thought and has bequeathed to us the concept of a histological and physiological base for the specialty. The peculiar features of cervical carcinoma made it attractive as a proving ground for radiation therapy. Radiology and histology early became accepted as half-brothers by gynecology and have by and large magnificently accepted their new tasks and relationships. The three must now understand one another entirely if a stable basis for progress is to be laid. Already a new child of astounding proportions, the radio-physicist, is well on his way toward confounding the family peace. And unless all judgment be false, we might just as well prepare bed space at once for new twins, the tumor physiologist and the tumor biologist. What a stirring family this is likely to be!

The scope of this paper necessitates the choice of only a few problems for discussion and no claim can be made to completeness. The old arguments about the relative value of surgery and radiation as a primary attack upon squamous cell carcinoma of the cervix and the question of the organization of tumor clinics will not be considered.

A problem which will require early consideration is the question of the hospitalization of the patient undergoing radiation therapy in the lower abdomen. One can speak feelingly about this in view of experiencees with both out-patient and in-patient therapy. There is every reason to believe that there is value to be obtained from modern massive radiation therapy. In the author's own short experience the x-ray dosages have been nearly doubled. Where this is applied as in the pelvis with large fields and resultant large volume dosage, a considerable number of serious side effects appear which must be recognized and treated early and efficiently if the patient is to be protected and if the therapy is to be continued so that the biological dosage is not to be spoiled by disturbances in the time factor and relative recovery rates. It has been learned that skin, bladder and gut can be protected by control of the necessary factors and these are scarcely applicable except by institutionalization. Protection from the spread of infection by local procedures and accurate observation of early danger signs can be carried out efficiently only with the patient under complete control. The early recognition of red cell, lymphocyte and granulocyte destruction is of great and occasionally vital importance. Recognition of the necessity for the preservation of normal tissue in a sufficiently healthy state so that it can recover and scar effectively, has not only had an influence on the determination of dosage but has produced an awareness of the necessity of controlling anemias by food and transfusion. These are not out-patient procedures and it is suggested that routine hospitalization is essential to efficiency and massive dosage.

Two questions will immediately arise. Is massive dosage, as it is used at present, justifiable? And is it economically possible to institutionalize all such patients that require this form of therapy?

All the weight of experimental, theoretical and clinical evidence presently available, would seem to entirely support the massive dose technics. Schmitz, of Chicago, who has carried the dosage in pelvic x-ray irradiation well beyond those ordinarily used, has been able to show survival rates which are better than those previously obtained and it may well be that we are headed for still more massive therapy. It should be understood that increase in dosage must be measured, insofar as possible, in terms of biological dosage. Increasing physical units of energy delivered alone, does not constitute increase of biological dosage. At the University of Minnesota Hospital relatively small dosages have been previously applied. The recovery rate in squamous cell carcinoma of the cervix under those conditions has been found to be 20 per cent. If this is an adequate sample, as there is every reason to believe that it is, massive dosage may be expected to increase that by 50 per cent and there is some hope in the survival rates to date that this is being attained.

The economic possibilities bring up questions which are not yet solved. What is perfectly clear is this. If an improvement in recovery rates can be demonstrated for the institutionalized patient, and I believe it can, then some method of institutionalizing them must be found.

It is rather surprising that there is not general agreement on the order in which x-ray and radium should be given in such a lesion as cervical carcinoma. There is a very definite primary mortality associated with radiation in this disease and the great majority of these patients die from infection spread. Occasionally, tuberculosis is present in the pelvis and sudden massive dosage will spread this about in a disastrous fashion. The use of preliminary x-ray in divided doses allows the physician to watch the patient's response and to manipulate the dosage as required to meet disturbances as they become evident. During the four weeks approximately during which x-ray irradiation is given, the infected tumor mass is for the most part sloughed away and clinical experience has taught that it is then safer from the point of view of infection spread to apply intrauterine radium containers. It is also possible that the castrated tumor cells will show to a lesser degree than those which have not been radiated, the undesirable response to trauma which is so well known.

This same question of the effects of trauma upon tumor spread has been raised in considering the desirability of preliminary biopsy. Some authors have reported observations in which biopsy was followed by explosive widespread metastasis. It is clear that this is an occasional occurrence in non-traumatized tumor. Dr. Robert Meyer has studied surgically removed breast cancer which had been biopsied without finding evidence of fresh metastases. The value of biopsy in diagnosis is clear and many serious errors will be avoided by its use. But the experimental evidence in regard to the disturbances brought about by trauma to malignant tumor is also clear. It would seem that biopsy should always be carried out but it should be associated with an absolute minimum of trauma. Some form of cutting current loop recommends itself for this purpose.

The question of the control of dosage and its division, as applied to tumors at depth in the pelvis at least, will not be well based until more is known of the biology of the absorption of radiation energy. It has been gradually established by clinical experiment that the best results can be obtained with maximum doses in such lesions as cervical carcinoma. By maximum doses one means the maximum amount which can be delivered without too great an incidence of permanent damage to other organs and which will still leave surrounding connective tissue in a sufficiently healthy state so that it may recover and react by proliferation. This is spoken of as massive dose therapy. This must be considered in terms of biological units and not in physical units. Unfortunately we have no method of correcting the variables, physical units and time into a biological unit product. For that reason, there has been a general tendency to standardize the time factor for x-ray and for radium in a dogmatic way to get rid of the variable time factor and to vary the biological dosage in terms only of physical units. This would recommend itself more to reason if there were sound experimental confirmation for a choice of time factor. With the exception of certain skin tumors and tumors of the larynx, pharynx and tonsil, there is no very clear cut clinical information to support the superiority of the single dose method of Wintz, the prolonged therapy of Coutard or the generally accepted American division for pelvic tumors of twenty-five to twenty-eight days. Many clinical investigators have chosen this and hold to it so as not to disturb the time factor. Physical units of dosage are then varied until a maximum dosage is determined which will, for example, produce not more than 2 per cent of rectal strictures or a 1 to 2 per cent primary radiation mortality.

Similar rules are applied to surface radiation therapy from radium or radon. An arbitrary time of 100 hours is chosen which is adhered to in all cases. The variables then are the number of milligram-hours and the distribution. Distribution is fairly adequately corrected by equivalent adjustment of the milligram-hour total so that biological dosage at the desired site is controllable by varying only one factor, the number of milligram-hours. For so-called surface irradiation with radium or radon, wherever possible, a standard focal distance of one centimeter is used throughout. By adjusting active radiation length and milligram-hours, a single factor is left and biological dosage may be adjusted by varying this.

It should be understood that by dosage, there is meant the only possible interpretation of that, which is the dosage delivered to the tumor or a chosen point related to it which is to be treated. It is just as silly to speak of x-ray dosage to a cervical carcinoma in terms of the number of physical units given to the skin of the abdomen as it would be to speak of the dosage to a surface tumor by radium in terms of milligram-

hours without reference to distribution, active radiation length or focal distance. To reduce it to the absurd is to compare it with the statement that the reading light from an electric lamp can be expressed in physical terms of the current flowing through it and quite irrespective of whether the material to be read be placed beside the lamp or across the street. This illustration may sound absurd and it is in most cases of x-ray dosage since those who use this form of therapy are skilled in its control. It is not absurd when applied to a large number of those who use radium and radon. These agents are more accurately controllable in the uterus, cervix and vagina than are x-rays. Known dosages are required and accurate charts are available for use. They are more honored by neglect than by use.

The conclusions are obvious. Each tumor and each patient must be individualized. The utmost possible accuracy must be applied and the various tools of accuracy must be used. It is only thus that the greatest possible salvage can be obtained.

A few interesting problems associated with specific gynecological tumors might be considered. These are chosen at random for their interest rather than any other reason.

The study of the origin of squamous cell carcinoma of the cervix has yielded no information comparable to that which has appeared from work on breast cancer. But a few bits of information are becoming clear. The old myth quoted from text book to text book that carcinoma of the cervix arises in cervical erosion has been exploded. This mistake was probably due to the fact that active erosion healing is all too often mistaken for carcinoma itself. Accurate study of early carcinomas show that, insofar as the genitalia, at least, are concerned, carcinoma does not arise in young but only in aging tissue. Primary squamous cell carcinomas are for practical purposes unknown in the squamous epithelium of polyps of the endometrium or cervix although carcinoma may become polypoid or may invade polyps. Neither is malignant degeneration seen in cervical erosions unless it has invaded them. But the great majority of early carcinomas arise in the old squamous epithelium at the margins of areas of erosion healing. The active repair processes associated with chronic inflammation do not pass over into malignancy. What effect the inflammation has in the production of malignant change in the surrounding tissue is not clear. It would be wiser to hold the idea of the relationship sub judice for the present.

Dr. Robert Meyer has also demonstrated by the study of very early carcinomas here that the tumor always arises from the basal cells over a limited area. Whether it begins in a single cell or not cannot be determined. The tumor grows by cell proliferation from this point, destroying the normal epithelium at the circumference and above. It can be readily diagnosed before it has ruptured the basement membrane. The old idea that the demonstration of invasion is necessary for a diagnosis of malignancy in such tissues has again been shown to be wrong. It might be pointed out at this point that leucoplakia of the cervix is not an obligatorily so-called precancerous lesion and that cancer cells may show a secondary leukoplakic change.

It might also be stated that histological classification of squamous cell carcinoma of the cervix has not proved to be the useful tool which it was once hoped that it might be. The cellular differentiation is a secondary quality. By comparison with the invasive qualities and the degree of extension which are shared by all histological types it can scarcely be said to be of any importance whatever.

There are three problems in cervical carcinoma for which no adequate answer is available. These are problems of the tumor in young people, arbitrarily stated as younger than thirty years, the problems of the adenocarcinoma of the cervix and that of the tumor, recurrent after treatment.

Carcinoma of the cervix in young women has the same clinical significance as that in the breast in a similar age group. Growth is rapid, metastases are early and recurrences almost the rule. It is not clear why this should be. The author has attempted to change this series of events by the use of daily fever therapy during treatment, post-treatment radon seeding and extension to very heavy dosage. No certain results have been obtained. At present, the department of Obstetrics and Gynecology at the University Hospital is carrying out Wertheim operation four weeks after the completion of therapy in operable tumors in this age group in order to get a series for evaluation. It is quite certain that this age group should be given a separate and very guarded prognosis.

Strange as it may seem, there is no accurate

information as to just what treatment is most productive, or what results can be obtained in adenocarcinoma of the cervix. Some clinics have reported no cures whatever while others rank the lesion as similar for purposes of treatment and prognosis to the squamous cell tumor. This confusion is likely due to three facts. It is often impossible to tell from histological diagnosis alone whether a given adenocarcinoma arose from the cervix or the uterine fundus. The later may extend to the cervix. The difference in natural history, treatment and prognosis are common knowledge. One suggests that many cured cervical adenocarcinomas were in reality adenocarcinomas of the corpus. Secondly, there is an adenoma malignum which occurs in the cervix. It is not as widely recognized as it should be. But it extends slowly and only locally in the majority of cases for a considerable period of time. These are comparatively readily curable and undoubtedly are included in some of the adenocarcinoma figures. Strictly speaking, they are adenocarcinomas and will destroy the host if untreated. But the inclusion of a neoplasm with such a different natural history as this, with the adenocarcinomas has not helped toward clear thinking in the latter condition. A third source of confusion lies in the fact that adenocarcinoma of the cervix is undoubtedly overdiagnosed. Squamous cell tumors may take an adenomatous-like form under a number of circumstances which are not worth detailing here. All of this makes it likely that the more pessimistic reports approximate reality. Adenocarcinoma of the cervix is being treated by radiation therapy followed by Wertheim operation in operable cases, in the hope of increasing the salvage.

The problem of local recurrence can lead only to the conclusion that some tumors, and they cannot be recognized before treatment by any means presently available, are as completely radio-resistent as the surrounding normal tissue. These tumor cells have been exposed to dosages, not in biological terms but in terms of the simple summation of x-ray and radium dosage, of the nature of between 15 and 25 erythema doses and yet survive. There is a suggestion that the surrounding tissue reaction may be at fault. All of us have seen tumors in cachectic patients treated by radiation. The tumor is readily sloughed away but scarring is absent, a crater remains and the tumor recurs. This is strong evidence that the healing of a tumor is in the final analysis a factor of normal tissue response, immunological response or some such factor. As has been suggested above, modern radiation therapy does not have as its primary aim the sloughing away of tumor but rather the interference with its reproduction, leaving the normal surrounding tissue in a state in which it can react. This should be the basis for dosage. It is assumed that healthy patients react similarly but there is no basit for such assumption and objective controls are lacking.

Under any circumstances, there is good basis for pessimism in attempts at repeat radiation for local recurrence and clinical experience lends bitter support to this view. Again, it focuses attention on the necessity for careful organization of the first attempt at treatment.

There is little to be said that is new or of promising interest in regard to carcinoma of the body of the uterus. It may seem trite to again state here that all uterine bleeding should be suspected of being due to malignancy until proven otherwise by histological means. It is hard to believe that any student could graduate without having attained that intellectual height. But they do. One thinks sometimes that ergot must have achieved first place in the treatment of this disease. Small bits of radium are applied in the delightful fancy that the lesion is a "functional bleeding," whatever that may be. And subtotal hysterectomies are done because a myoma is present. Adenocarcinoma in the cervical stump is not a nice disease.

This is perhaps the place to urge against the application of radium at the same time the diagnostic curettage is done. It is true that very often a diagnosis made on the gross material is correct. But it is also true that even frozen section reports on the same tissue are frequently in error. The same may be said of the negative diagnosis. Small doses of radium under these circumstances can only confuse the problems. And under any circumstances, radiation should for practical purposes never be used in the absence of an accurate diagnosis. This, the process of reaching a diagnosis in suspected malignancy, is the time to go slowly and carefully, taking only one step at a time as the way becomes clear.

It is becoming less and less likely as accurate information is obtained, that radiation therapy will constitute an acceptable primary atack upon adenocarcinoma of the uterine corpus. For about

five years the author has routinely subjected these patients to preliminary x-ray and radium radiation, followed in about four weeks by panhysterectomy. This allows accurate study of the results of the radiation. It has shown that with adequate x-ray and adequate distribution of the radium (which is not satisfied by a tandem applicator, be it noted), tumor which is confined to the surface has disappeared so far as microscopic study can determine. This does not necessarily mean that all tumor is gone.

On the other hand, tumor which has invaded the uterine muscle will sometimes show no morphological evidence of radiation effect. There is no way of determining which tumors have invaded and which have not. Tumor in the muscle is more dangerous than that on the surface since it is clinically silent. The operation carries only a 1 per cent mortality when very accurately controlled from the point of view of infection and offers in the operable cases a 60 per cent cure rate. The operative attack is still the standard method of treatment.

The department is planning very shortly to change the procedure at present employed and to substitute preliminary radium irradiation alone, followed by operation. It is likely that this will offer all of the advantages of the more thorough irradiation in the direction of cleaning up infection before operation. Under any circumstances, interesting comparable information will be forthcoming.

BRONCHIOGENIC CARCINOMA*

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BRONCHIOGENIC cancer has become the most interesting pulmonary disease of the present day. This is the result of three facts. In the first place, within a quarter of a century, cancer of the lung has developed from a rarity to a disease of comparative frequency. Secondly, as a result of its rise to prominence, thoracic surgery has become the treatment of choice rather than the court of last appeal. And thirdly, pulmonary cancer is to chest diseases what syphilis is to systemic syndromes, the great imitator. In order to present these and other features, a résumé of all aspects of pulmonary cancer will be outlined in this paper.

Historical Data

Bronchiogenic cancer can be traced back to the writings of Agricola in 1521. Mathesius, in 1559, and Pansa, in 1614, described cases which later were proved to be pulmonary malignancies. These were the Schneeberg mine cancers, and were not recognized by the authors as true pulmonary cancers. So, priority in describing bronchiogenic carcinoma belongs to Morgagni, who, in 1761, described a case in which necropsy revealed a cancerous ulcer of the lung. The second authentic pulmonary cancer was reported by Bayle in 1810. By 1878, the number of cases recorded in the literature, as reviewed by Reinhardt, had increased to twenty-eight. Since then, the number has gradually increased until at present the disease is no longer a rarity.

Incidence

Both the actual number of pulmonary cancers reported and a constantly growing literature on the subject reflect an increased frequency of these neoplasms. However, more than these evidences are required to determine whether the increased incidence is absolute or relative. Many investigators claim that the increased frequency is due to improved clinical acumen, greater interest in the disease, and increase in the number of postmortem examinations. Those who believe that an actual increase has occurred, maintain that the percentage increase of pulmonary cancers in all autopsies, and, above all, a percentage increase of pulmonary cancer in all cancers found at autopsy, prove irrefutably the reality of the increase.

In the United States, England, Germany, Switzerland, France, Russia and Argentina data have been presented proving both an increase of

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pulmonary carcinomas in all autopsies and an increase in the percentage of all cancers found to be primary pulmonary cancers. Thus, then, a preponderance of evidence from widely scattered countries shows an absolute increase in the incidence of these neoplasms.

Etiology

In reviewing the causative factors, fourteen different etiologic agents have been found in the literature. Without exception, all of the suggested causes have one common quality, the production of chronic pulmonary irritation. Chronic irritation may be chemical, mechanical, bacterial, radio-active, or thermal. Several of the causes or possible causes may be classified under two or more of these headings, but all of them fall under at least one. Since the suggested causes are so diverse, the only conclusion possible is that irritation, which is common to all of them, is the real causative agent in the disease.

Pathology

From 75 to 90 per cent of these cancers arise in the large bronchi two or three centimeters from the tracheal bifurcation. These are known as the hilar or central type. The rest arise from the terminal bronchioles, and are known as peripheral pulmonary cancers. Their size varies from small outgrowths of the bronchial mucous membrane to tumors the size of a man's head. The larger tumors are soft and not unlike caseous tuberculous masses, sometimes with cavities filled with mucus, pus or necrotic material. Those containing many mucous glands are softer and more slimy than the others, as are also their metastases.

Within the past few years, the "oat-celled" tumors of the English have been reclassified as pulmonary cancers. At present, most of the superior pulmonary sulcus tumors are conceded to be cancers of the lung originating in the terminal bronchioles. Now, also, many endotheliomas of the pleura have been proved to be actual pulmonary carcinomas. The significance of these findings is that even within comparatively recent years, three pathological entities have been reclassified as pulmonary carcinomas.

Histogenically, also, much progress has been made in recent years. Previously, pulmonary carcinomas were thought to have three cellular origins: the bronchial epithelium, the bronchial mucous glands and alveolar epithelium. The present consensus of opinion is that all pulmonary cancers, regardless of the predominant cell type, arise from the basal cells. Consequently, the previous triad of origin has been replaced by the present unicellular concept.

Clinical Considerations

Symptomatology—All of these tumors arise within a bronchus, and, therefore, obstruction of the flow of air into or out of the lung becomes the principal mechanism in the production of symptoms. Two other factors in the cause of symptoms should be mentioned. First, as with cancer elsewhere, ulceration and hemorrhage are among the first evidences of these tumors. Secondly, the bronchiogenic cancer simulates a foreign body which nature is trying to extrude, so cough, either with or without sputum, is one of the most frequent manifestations.

The symptomatology may even suggest the location of the carcinoma. Cough and hemoptysis result from ulceration of tumors of the larger bronchi. In the peripheral tumors, cough either is entirely absent or occurs late as a result of pressure on a large bronchus. Paterson has stated that the blood-cough complex is characteristic of the central type, and pain is the early typical symptom of the peripheral type.

The frequency of symptoms in 1,456 cases so analyzed was as follows:

Symptom	No. Cases Analyzed	No. Cases with Symptom	Percentage Cases with Symptom
Cough	1376	996	72.3
Sputum	1217	822	67.5
Pain	1439	861	59.8
Dyspnea	1299	716	59.7
Emaciation	1187	573	48.2
Pyrexia	1112	477	42.8
Hemoptysis	1456	583	40.0

Other symptoms such as dilated veins, cyanosis, night sweats, vomiting, hoarseness and clubbed fingers occurred with varying frequency in less than 20 per cent of the cases. Thus, it is seen that cough occurs in three out of four cases; sputum, pain and dyspnea in three out of five; and fever and hemoptysis in two out of five cases. While emaciation occurs in almost 50 per cent of these patients it is usually a late manifestation and should not be expected early.

Certain symptoms or groups of symptoms should lead one to suspect the diagnosis. For instance, pain in the chest which is persistent

and not relieved by strapping should arouse suspicion. Dyspnea is one of the most frequent complaints that directs the patient with pulmonary cancer to the physician. One clinician has stated that hemoptysis is as suggestive of carcinoma of the lung in an adult as of tuberculosis in a younger person. In any atypical pulmonary disease in an adult, especially if characterized by cough, pain, dyspnea, or hemoptysis, pulmonary cancer should receive first consideration.

Physical Signs.—The most frequent early signs discovered by examination are decreased mobility of the chest, dulness or flatness extending outward from the hilus, and suppressed breath sounds. One day breath sounds are heard accompanied by râles while the next day either or both will have disappeared. This variability is characteristic of the disease.

On inspection, breathing is labored and chest movement lags or is absent. Unilateral limitation of expansion is frequently seen. If the disease has advanced far, asymmetry of the chest is present. When effusion is present, the intercostal spaces may bulge. In the late stages, the veins of the chest wall are distended, and edema of the face, neck, arms or hemithorax may be visible.

Tactile fremitus usually is decreased or absent on the diseased side. It may be increased on the unaffected side. The cardiac impulse is usually displaced toward the pulmonary lesion. Tenderness of the intercostal spaces can often be elicited. Enlarged glands may be palpated above the clavicles or manubrium sterni or in the axilla.

Percussion usually produces a dull sound, or, if obstruction is complete, a flat note. Dulness is often found an inch or two to one side of the sternum with a normal area between the dull space and the clavicle. Staehelin has said that a circumscribed area of dulness with decreased breath sounds and vocal fremitus indicated almost certainly the diagnosis of pulmonary cancer. Nowhere else in pulmonary diseases is found the hard stony resistance in percussion that is noted in pulmonary cancer.

In auscultation, the most typical finding is suppressed or absent breath sounds. When a tumor closes or fills a bronchus, collapse of the part of the lung supplied by that bronchus takes place. Then, breath sounds are absent and both vocal and tactile fremitus are diminished or absent.

Differential Diagnosis

Pulmonary cancer can simulate any intrathoracic disease. Consequently, any intrathoracic disease which does not run a typical course or which produces atypical symptoms or findings should lead one to suspect a bronchiogenic carcinoma.

Pulmonary cancer is to be differentiated from three groups of diseases: (1) those pulmonary diseases caused by micro-organisms; (2) those diseases involving the hilar and mediastinal structures; and (3) miscellaneous vascular and other lesions. In the first group are to be found tuberculosis, bronchiectasis, unresolved pneumonia, lung abscess, echinococcic cysts and mycotic diseases. Among hilar and mediastinal diseases to be differentiated from pulmonary cancer are Hodgkin's disease, lymphoblastomas, mediastinal gummas and abscesses. And in the third group are benign tumors, carcinoma of the trachea and esophagus, Pott's disease and tumors of the spine, and the various aortic aneurysms.

Since pulmonary cancer is most frequently mistaken for tuberculosis, some of the salient points in differentiating these two diseases should be mentioned. In tuberculosis, fever and tachycardia are usually present. They are absent except late in the course of bronchiogenic cancer or as a result of the complications it causes. Dyspnea is rare in tuberculosis, but frequent in cancer. In tuberculosis, there is usually little pain, yet this symptom is common in cancer of the lung, especially in the peripheral type. Tuberculosis makes its first appearance usually before the age of thirty-five; carcinoma appears most often after that age. Consequently, in tuberculosis appearing after the age of thirty-five, previous attacks can be elicited in the history.

Cancer usually spares the apices, whereas tuberculosis often involves them. Cancer is almost invariably unilateral, while tuberculosis is frequently bilateral. Impaired resonance with diminished or absent breath sounds is typical of cancer. Impaired resonance with bronchial breathing is characteristic of tuberculosis. In pulmonary cancer, the impaired resonance is flat, while in tuberculosis, it is dull. Râles are either seldom heard or are variable from day to day in cancer, but they are usually constantly heard in tuberculosis.

Laboratory and Other Diagnostic Aids

Pleural Effusion.—This occurs in from one-third to one-half of these cases. The fluid may be serous, purulent or bloody, and when it is the latter, pulmonary carcinoma is by far the most likely cause. None of the other effusions is so prone to fill the entire chest as is a cancerous one. Malignant cells can be demonstrated with sufficient frequency to make an examination of the fluid advisable.

Sputum.—In 1935, Dudgeon and Wrigley perfected a technic for the examination of sputum for cancer cells whereby they were able to demonstrate the histologic type of growth in twenty of twenty-six cases of proved pulmonary carcinoma. The finding of tubercle bacilli in the sputum does not refute the diagnosis of pulmonary cancer.

Roentgenology. — X-ray studies reveal two types of pulmonary cancer: the hilar or central, and the peripheral.

Hilar or central pulmonary cancers have two roentgenological characteristics that are of diagnostic importance. The first, hilar density, is unilateral, is roughly triangular with the apex pointing outward, and from the border strand-like processes radiate outward toward the lung periphery. This density usually lies opposite the space between the sixth and eighth ribs or at the level of the seventh rib posteriorly. The second characteristic, atelectasis, is a smooth, homogeneous density, anatomically limited and carrying the normal lung markings. The appearance of bronchiectasis, a mottled fan-shaped density at the costophrenic angle, also is suggestive of a bronchial tumor. In addition to these evidences, elevation of the diaphragm on the affected side, and displacement of the heart and mediastinum toward the pulmonary lesion are characteristic of atelectasis, and therefore suggest bronchial cancer.

In the less frequent peripheral type, the characteristic findings in the x-ray plate are either a solitary, round shadow in the lung field, or a massive involvement of one or more lobes. The solitary, circular form is recognizable as a dense, round area usually without the sharp-defined edge seen in the shadows of metastatic deposits. Such primary lesions are invariably single, which fact distinguishes them from metastatic growths. The massive lobar type appears as a complete consolidation of a whole lobe, less dense than fluid, without mottling of any kind nor with the varied texture seen in most cases of lobar pneumonia. The border or edge is an irregularly infiltrating one.

In fluoroscopy, Polevski has described the following triad of findings as pathognomonic of pulmonary cancer: (1) elevation of the diaphragm on the affected side; (2) paradoxical or "seesaw" movement of the diaphragm; and (3) pendulum movement of the heart toward the side of the lesion in inspiration and away from it in expiration.

Bronchoscopy.—Conclusive proof of the diagnosis depends upon biopsy, which is best accomplished by bronchoscopy. Early diagnosis by bronchoscopy is possible in 75 per cent of these cases.

Treatment

Aside from palliative measures, the treatment of pulmonary cancer is either surgical removal or irradiation. Many authors consider irradiation as palliative only; others maintain that it is potentially curative; still others regard surgery as the only possible means of cure.

Palliative measures may be directed to the patient's general well-being, to complications and sequelæ, or to specific symptoms. Pain is usually due to pleural involvement and may be relieved by sand bags and strapping. Heroic doses of opiates are often required. Artificial pneumothorax, injection of alcohol or section of the dorsal roots may be necessary to relieve pain. Dyspnea and cyanosis are caused by increased pressure within the pleura. Aspiration of the effusion frequently provides temporary relief. The sitting position and lying on the diseased side may improve the shortness of breath. Cough may be influenced only by antispasmodic cough mixtures or opiates.

Irradiation consists either of x-ray therapy or radon seed implantation into the growth. Many radiologists believe that such treatment is the most effective so far devised from both a curative and palliative standpoint. Some writers however contend that the radioresistant cells of pulmonary cancer make such treatment ineffective and that immediate, palliative results of irradiation are usually followed by a more rapid downhill course which terminates in death.

Surgical treatment is divided into curative bronchoscopic procedures and actual surgical excision. Eleven cures have resulted from bronchoscopic excision, cauterization or radium implantation. However, opinion prevails that the type of tumors for which such treatment can be used composes a minority of pulmonary carcinomas. Therefore, it appears that wide excision rather than bronchoscopic treatment would be the treatment of choice.

Surgical excision is accomplished by either lobectomy or pneumonectomy. It is in the technic and successes of thoracic surgery that some of the most remarkable advances have been made during the past few years. For instance, in 1920, Sauerbruch compiled fifteen surgical extirpations of the lung. In 1934, Heuer found reports in the literature of 225 lobectomies and pneumonectomies of which thirty-three were for pulmonary cancer. The present consensus of opinion concerning treatment of pulmonary cancer is that radical excision is the treatment of choice, and it alone offers a reasonable likelihood of cure.

In conclusion, mention should be made of the surgical personnel available to physicians practicing within the territorial boundaries of this society. Remarkable contributions to the field of thoracic surgery have been made by Alexander and Haight of Michigan, and by Graham of St. Louis. In fact, experienced and well-qualified thoracic surgeons are to be found in practically every state in the conference. Here in Minnesota, we are fortunate in having available as thoracic surgeons such widely recognized men as Kinsella, Wangensteen, Gardiner, Gray and Harrington.

BONE MARROW BIOPSY*

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SINCE Seyfarth[29] (1923) described a method of trephining the sternum and particularly since Arinkin[1] (1929) introduced aspiration biopsy, examination of the bone marrow during life has become an accepted diagnostic procedure in diseases of the hematopoietic system. Sternal biopsy is by no means necessary in all hematologic conditions but is frequently a valuable source of information in those instances where the diagnosis cannot be established on the basis of the usual clinical and hematological findings. Certain more or less well-defined limitations to the method exist and only with regard to these limitations can the usefulness of sternal biopsy be properly evaluated. It is intended here to briefly outline the findings in the more commonly encountered hematologic conditions where examination of the marrow may be of aid to diagnosis and at the same time indicate certain of the difficulties in interpretation of these findings.

Methods

Examination of the sternal marrow is advantageous not only because of the accessibility of that bone but because the hematopoietic activity of sternal marrow is sustained throughout life (Custer and Ahlfeldt[4]) and in general is indicative of the character of the hematopoietic tissues as a whole (Stasney and Higgins[30]). Instances of irregularity of the composition of the sternal marrow may be encountered but material removed by biopsy may usually be considered representative.

Trephine biopsy consists in the removal of a plug of bone from the outer table of the sternum. The marrow adherent to its inner surface may be used for both imprints or smears and histologic sections. While this method affords excellent material for study, the required cutaneous incision is objectionable particularly if repetition of the biopsy is desirable or necessary. Furthermore, while the topographic relationships of the marrow are preserved in section, smears or imprints are indispensable for accurate identification of the various immature cells. Consequently the technically simpler aspiration biopsy has achieved greater popularity. Properly executed it causes but little more discomfort than does a venapuncture, leaves no scar and may be repeated as frequently as desired.

In aspirating marrow there is a certain amount of unavoidable dilution with sinusoidal blood.

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In hyperplastic marrows, and in any instance from accidental excess dilution, so few cells may be obtained that examination of the smears is very tedious and one may not be certain that the material observed is representative. In order to more uniformly provide adequate amounts of marrow for examination we have adopted at the University of Minnesota Hospitals a method of concentrating the cells obtained by aspiration. The technic is based on a method devised by Schleicher and Sharp[26] and further described by Limarzi.[16]

The sternal marrow may be approached either directly through the outer table of the manubrium or sternal body or through the sternomanubrial junction. All of these sites have been used but the sternal body in the third interspace or at the upper margin of the third rib is usually recommended. The structure of the sternum varies and no one site is satisfactory for all cases. The skin, subcutaneous tissues and periosteum at the elected site are infiltrated with procaine. A short 18-gauge spinal puncture needle is then forced into the bone at an angle of 45° (the point toward the head of the patient) until a sudden "give" indicates that the marrow cavity has been reached. The stilet is then removed and, with a tightly fitting, dry syringe (10 or 20 c.c. size), about 1 c.c. of material is aspirated. When the needle is properly placed the flow is prompt, steady and the patient usually experiences a "suction" pain. Unless such a flow is encountered the stilet is replaced and the needle shifted slightly in depth. If this maneuver repeatedly fails to result in a free return a new site is tried. Prolonged aspiration in the absence of a reasonably free return of fluid does not yield satisfactory material.

The aspirated material, composed of a mixture of sinusoidal blood, hematopoietic marrow and fat, is immediately transferred to a paraffined tube containing a minute amount of heparin as an anticoagulant. (Heparin is superior to other anticoagulants for it occasions less disturbance of cellular morphology.) A hematocrit tube is then filled with this mixture and centrifuged at from 2,000-2,500 RPM for five minutes. Centrifugation separates out the following layers reading from top down in the tube: (1) fat; (2) plasma; (3) myeloid-erythroid cells; (4) erythrocytes. The heights of the several layers are recorded. The fat and plasma are removed separately and discarded. The myeloid-erythroid layer, together with a small amount of the erythrocyte layer is pipetted off separately, transferred to a paraffined watch glass, mixed, and from this material smears are made and stained with the May-Grünwald-Giemsa combination. As originally described the method called for the preparation of smears from a mixture of equal parts of myeloid-erythroid, plasma and erythrocyte layers. Thus the supernatant plasma is removed to the point where the height of the plasma layer equals that of the myeloid-erythroid layer and then the remaining plasma, myeloid-erythroid layer and an equal portion of the erythrocyte layer are removed together, mixed and smeared. More cellular smears are obtained by taking only the myeloid-erythroid layer, and as this material is often rather tenacious, smearing is facilitated by adding a small proportion of the erythrocyte layer. The manner in which this step of the technic is employed is largely a matter of preference. Occasionally there is no grossly demonstrable myeloid-erythroid layer and in such cases the extreme superficial portion of the erythrocyte layer is removed for the preparation of smears for it will contain what nucleated cells are present.

Cellular Composition of the Marrow

In discussing the cellular composition of the marrow under both normal and pathologic conditions it is necessary to refer at least briefly to the question of terminology, for the existing differences in terminology in hematological literature are a constant source of confusion.

We employ that used by Downey.[8] For purposes of orientation it may be briefly stated that the myeloblast is the stem cell of the marrow under normal conditions. From it are derived: (1) granular leukocytes through leukoblast, promyelocyte, myelocyte and metamyelocyte stages; (2) erythrocytes through pronormoblast, basophilic normoblast, polychromatophilic normoblast and orthochromatic normoblast stages; (3) megakaryocytes. Megaloblasts are never found in normal marrow. With very few exceptions they are peculiar to pernicious anemia in relapse and develop from the myeloblast into the usual macrocytic erythrocytes through promegaloblast, basophilic megaloblast and the orthochromatic megaloblast stages.

The cellular composition of the marrow is expressed in several ways. Such calculations as

the myeloid-erythroid volume, the differential count, the myeloid-erythroid ratio and the maturity dispersion are all used in analysis by various writers.

The myeloid-erythroid volume (M-E volume) refers to the percentage of the total column in the hematocrit tube made up by the myeloid-erythroid layer of cells. This determination gives some information concerning the activity of the marrow but in any one instance is of limited value. Limarzi,[16] for example, found an M-E volume of 5 to 8 per cent in normal individuals, 1.5 to 3 per cent in aplastic anemia, up to 40 per cent in pernicious anemia, up to 75 per cent in chronic myeloid leukemia, etc. The M-E volume will vary not only with hyperplasia and hypoplasia of the marrow but with the amount of sinusoidal blood obtained at aspiration. Consequently an elevated M-E volume, while indicative of hyperplasia, may not express the actual degree of hyperplasia, and a reduced M-E volume may mean only excess dilution and not an actual hypoplasia.

The differential counts reported for normal marrows vary considerably, as any of the several collected tabulations of different authors will indicate (Scott[27]). Normoblasts, for example, constitute 12 per cent of the nucleated cells in one author's normals and 30 per cent in those of another. One author finds 3.5 per cent lymphocytes, another 24.9 per cent. Similar wide ranges are reported in the several myeloid categories. Megakaryocytes are usually estimated at much less than 1 per cent of the total. A very few reticulo-endothelial cells and plasma cells may be found.

The myeloid-erythroid ratio is the proportion of myeloid cells to erythroid cells. This value also varies from author to author. Limarzi[17] found the ratio in normal individuals to vary from 1.75:1 to 3.75:1. Stasney and Higgins[30] found a ratio of 1:1. The maturity dispersion refers to the percentages of the total myeloid and erythroid cells respectively made up by the several maturation levels in each group. These values also vary from author to author. As an example, Limarzi's values are shown in the accompanying tabulation (his terminology has been modified to correspond to ours).

Myeloid:	myeloblasts and promyelocytes	2.5%
	neutrophilic myelocytes	15-20%
	neutrophilic metamyelocytes	20-45%
	mature neutrophils	10-25%
	eosinophils (all stages)	2-5%
	basophils	Less than .5%
Erythroid:	pronormoblasts	Less than 5%
	basophilic normoblasts	20%
	polychromatophilic and orthochromatic normoblasts	75%

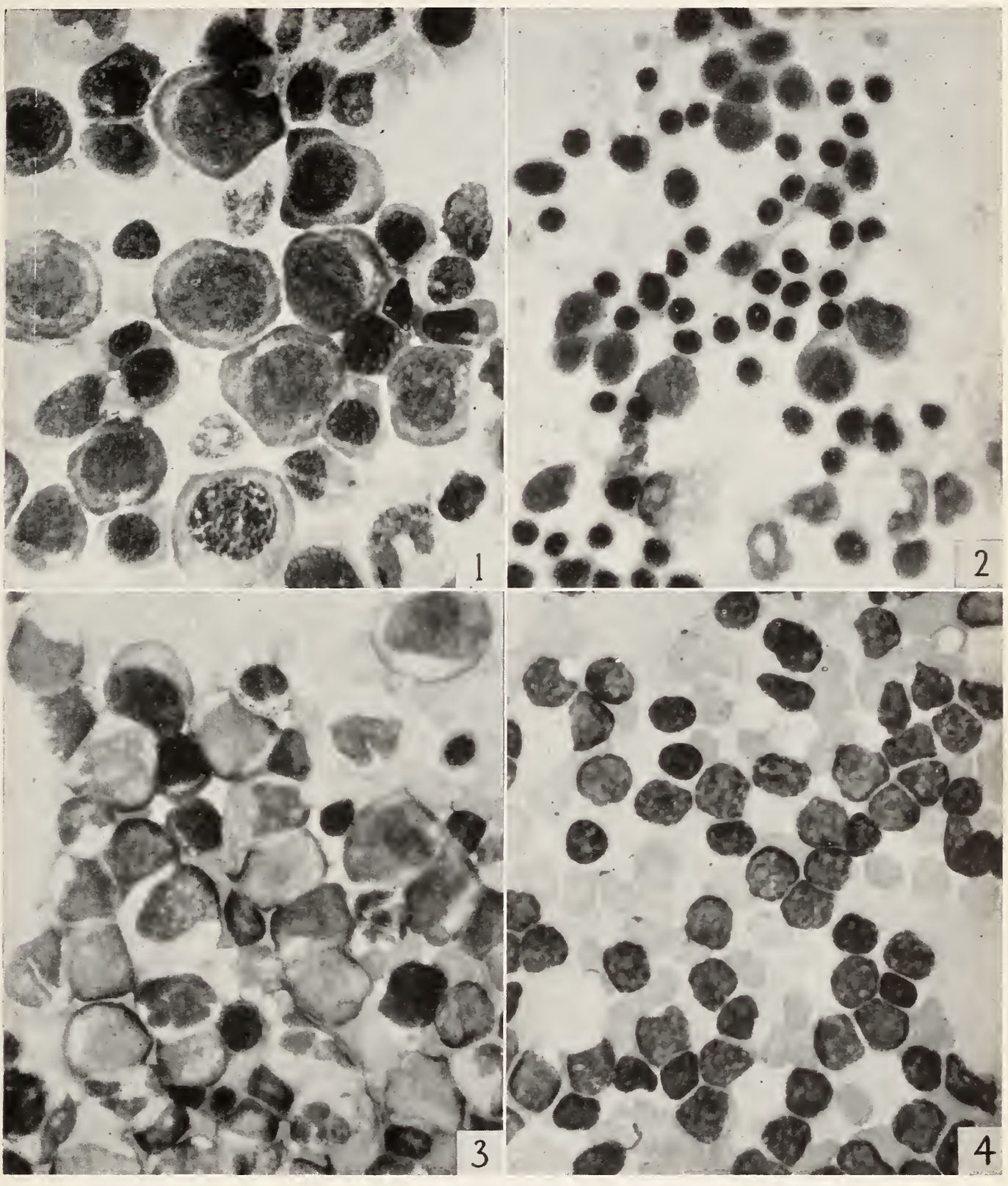
It is evident that the differential count, myeloid-erythroid ratio and maturity dispersons cover wide ranges as reported for normal individuals. Consequently only extreme alterations in these determinations are of significance. While the mathematical expression of the several values is very useful in detailed studies of the marrow under various circumstances, significant alterations, particularly as concerns the maturity dispersions, are apparent from examination of the smears and such calculations are in general unnecessary for diagnosis. Furthermore, just as in the examination of the peripheral blood, qualitative changes are of great importance. For example, the megaloblasts of pernicious anemia, and the abnormal myeloblasts (paramyeloblasts, monocytoid myeloblasts, etc.) peculiar to leukemia are frequently of greater importance than are quantitative changes alone.

The Anemias

The bone marrow of pernicious anemia in relapse is not only very hyperplastic but is also characterized by abnormal myelopoiesis and erythropoiesis. Normoblastic erythropoiesis is suppressed and largely replaced by megaloblastic erythropoiesis (Fig. 1). These megaloblasts are present in large numbers at various levels of maturation of which basophilic and polychromatophilic forms usually predominate. Megaloblasts are distinctly different from normoblasts and are characterized by a finer nuclear structure, more rapid accumulation of hemoglobin in proportion to the maturity of the cell, and usually by a larger size. The differences are recorded in detail and illustrated by Jones.[14] The marrow also presents immature stages of the characteristic pernicious anemia neutrophils of the peripheral blood (Downey[8]) in the form of large, hypersegmented neutrophilic promyelocytes, myelocytes, and metamyelocytes (Jones[13]).

Under the influence of liver extract the marrow rapidly undergoes profound changes. There is a rapid maturation of megaloblasts, no new megaloblasts are formed, and by the twelfth day only rare polychromatophilic and orthochromatic

megaloblasts may be found (Jones[14]). Coincident with this change there is a normoblastic hyperplasia, first characterized by the appearance of large numbers of pronormoblasts and basophilic normoblasts, which reaches its height prior to the maximum reticulocyte response of the peripheral blood but persists until hemoglobin and erythrocyte values of the peripheral blood approach normal levels. Pathologic neutrophils also disappear but much more slowly than the megaloblasts.



Aspiration biopsies of sternal marrow. May-Grünwald-Giemsa photomicrographs X 1000.

Fig. 1. Pernicious anemia in relapse. Note megaloblasts at various levels of maturation.

Fig. 2. Macrocytic hemolytic anemia showing normoblastic erythropoiesis.

Fig. 3. Acute myeloid leukemia. Maturing granulocytes as well as abnormal immature forms are present.

Fig. 4. Aleukemic lymphathic leukemia. Mature, uniformly small lymphocytes are shown.

In many cases of pernicious anemia the diagnosis may be established without resort to sternal biopsy. It is in those cases where the findings are atypical and not entirely diagnostic that biopsy is definitely indicated. The procedure permits a positive diagnosis in true pernicious anemia and eliminates the possibility in other macrocytic anemias. Most cases of pernicious anemia in relapse present a clearly diagnostic marrow. Cases in beginning remission—either spontaneous or induced—offer considerably more difficulty. The rapid disappearance of megaloblasts at the onset of remission has been noted. Under such circumstances exhaustive search may be required to demonstrate their presence. Here the immature forms of the pernicious anemia neutrophil have added significance, for their less rapid disappearance in remission may leave them as the only diagnostic feature of the disease. While the distinction between megaloblast and normoblast may be difficult on the basis of single cells, examination of the several maturation levels presented in the smears makes possible a definite statement as to whether the erythropoiesis observed is normoblastic or megaloblastic. It must be remembered that unusually large normoblasts (macronormoblasts) occur under a variety of circumstances, but that these cells maintain the morphologic features of the normoblast and resemble the megaloblast only in respect to size.

Contrasted with the megaloblastic erythropoiesis of pernicious anemia in relapse is the type of erythropoiesis seen in other anemias. As noted in idiopathic hypochromic anemia (Dameshek,[11] Segerdahl[28]), but equally characteristic of other anemias in which iron deficiency is the common denominator (hypochromic anemias of infancy, pregnancy, chronic blood loss and chlorosis) (Scott[27]), as well as in posthemorrhagic anemias, the macrocytic anemias other than pernicious anemia, and hemolytic anemias, there is a hyperplastic normoblastic marrow with relatively little disturbance, in the absence of infection, of granulopoiesis (Fig. 2). The qualitative features of the normoblasts may vary in these several conditions as may their maturity dispersions and the percentage of the nucleated cells which they comprise. The greatest normoblastic hyperplasia is seen in the hemolytic anemias, as in congenital hemolytic jaundice, where normoblasts may make up over 50 per cent of the nucleated cells (Weiner and Kaznelson,[32] Löwinger[18]). Megaloblasts are never found in these conditions and erythropoiesis proceeds along normal lines.

In aplastic anemias the described changes in the marrow vary with the individual author's concept of the disease. If extreme hypoplasia of the marrow is part of that concept, as expressed by Rosenthal[22] and others, then only such a marrow should be encountered. If the concept is based on clinical grounds a more variable condition of the marrow is found. Thus Rhoads and Miller[20] described marrows ranging from hypoplastic to hyperplastic. The term panmyelophthisis is often used synonymously with aplastic anemia but, as Schulten[25] points out, is best reserved for those cases in which extremely hypocellular marrows are demonstrable.

In acute aplastic anemia extremely hypocellular marrows are usually found. The M-E volume is very low, smears reveal but few myeloid cells and normoblasts, and lymphocytes frequently dominate the picture. Megakaryocytes are absent and there may be a few, commonly phagocytic, reticulo-endothelial cells and plasma cells. The condition of the marrow is well illustrated by the following case:

A white girl, nine years of age, was seen following a two-month period of weakness, persistent low-grade fever, purpuric episodes and a severe progressive anemia which had failed to respond to transfusions or other therapeutic measures. The peripheral blood contained 41 per cent hemoglobin (Sahli) and red and white cells numbered 2,050,000 and 2800 per cu. mm. respectively. The differential count revealed 95 per cent lymphocytes and 5 per cent neutrophils; there were no immature forms and both neutrophils and lymphocytes showed toxic changes. There were no reticulocytes. The cuff test was positive, the bleeding and clotting times were 30 minutes and 15 minutes respectively. Bone marrow aspiration was performed on two occasions. In each instance there was a grossly negligible M-E volume. The cells encountered were predominantly lymphocytes, most of which were leukocytoid. There were appreciable numbers of histiocytic reticulo-endothelial cells and a few plasma cells. Megakaryocytes were not found. There were a few polychromatophilic and orthochromatic normoblasts and the myeloid series was represented by rare myelocytes and metamyelocytes. In view of these findings a diagnosis of panmyelophthisis was made. At necropsy, a month after admission to the hospital, the marrow was like that found at the time of biopsy and there was no evidence of leukemia in any of the organs.

Chronic cases may show less disturbance of granulopoiesis, and erythropoietic activity varies.

There may be a distinct shift to the left in the maturity dispersion of the normoblasts, although, as indicated by consistently reduced M-E volumes, the hematopoietic activity is quantitatively suppressed. One case in which several biopsies were performed over a period of many months revealed variable degrees of normoblastic activity. It is probable that disappearance of hematopoietic marrow progresses unevenly in these cases and may account for some of the variations encountered. The activity of sternal marrow is ordinarily considered to be the most persistent of the entire hemotopoietic system (Custer and Ahlfeldt[4]), and it may appear active while that of the bulk of the blood forming marrow is more extensively suppressed.

Sternal biopsy is of distinct value in cases presenting the clinical picture of aplastic anemia. The changes in the marrow in symptomatic aplastic anemia which is the result of known toxic agents such as benzol, x-irradiation, prolonged infections and the like, are similar to those of the idiopathic form. The findings are, however, quite different when the anemia is produced by an aleukemic leukemia or a carcinomatosis of the bone marrow. If one encounters a cellular marrow in a clinical aplastic anemia the possibility of a remission is perhaps greater and in this sense may be of some value in predicting the course of the disease.

Agranulocytosis

In agranulocytosis the myeloid series alone is involved and erythropoiesis is not suppressed. Custer[3] and Fitz-Hugh and Krumbhaar[9] described failure of maturation and proliferation of myeloblasts. Darling, Parker and Jackson[7] described hyperplasia of stem cells and absence of more mature forms in rapidly fatal cases, hypoplasia of myeloid cells coincident with the appearance of many plasma cells and lymphocytes in fatal cases of longer duration, and rapid maturation during the recovery phase of favorable cases. Jaffé[11] emphasized degenerative changes in the myelocytes. Rohr[21a] described three types of marrow in agranulocytosis: (1) Severe cases with complete granulopoietic aplasia accompanied by proliferation of reticular cells (phagocytic, lymphoid and plasma cell types); (2) moderately severe cases with the marrow hyperplastic at promyelocyte-myelocyte levels; (3) mild cases with an essentially normal marrow but showing some reduction in metamyelocytes and band forms. Biopsy of the marrow is of some prognostic significance in this disease, for the cases with complete granulocytic aplasia have a less favorable prognosis than do those with cellular marrows.

Essential Thrombocytopenic Purpura

In essential thrombocytopenic purpura the marrow shows little disturbance of granulopoiesis, and erythropoietic activity varies somewhat with the degree of anemia that may be present. Studies of the marrow in this condition have been particularly concerned with the megakaryocytes. There is a notable increase of these cells according to Jaffé,[12] Rohr,[21b] Limarzi and Schleicher,[17] and others. Pathologic changes, particularly lack of granulation, were described by Frank,[10] Schminke,[24] and others. Markoff[19] considered quantitative estimations to be unreliable and found the same morphologic features in normal marrows as in this disease.

In the very few cases in which we have studied the marrow, the adult forms have not appeared to be more numerous than in many other marrows but young forms were more readily found. Morphological changes were not impressive. The practical value of biopsy in this disease is not significantly influenced by disagreement concerning the morphologic features of the megakaryocytes. Biopsy helps to separate this condition from other diseases, such as acute aplastic anemia and aleukemic leukemia, which may present a similar clinical picture. Wiseman, Doan and Wilson[33] listed biopsy of the marrow as one of the required diagnostic procedures.

Leukemia

Biopsy of the marrow yields no information of diagnostic importance in cases of leukemia presenting typical clinical and hematological findings. Biopsy is indicated in suspected cases in which positive evidence from other sources is lacking. Many cases present clinical features not unlike those of aplastic anemia, purpura, agranulocytosis, pernicious anemia, et cetera. Aleukemic and subleukemic phases of the disease are not uncommon, and under such circumstances sternal biopsy may immediately provide a diagnosis which would otherwise require an extended period of observation.

Chronic myeloid leukemia with a peripheral leukocytosis presents a myeloid hyperplasia with a maturity dispersion more or less approximating that of the peripheral blood (Segerdahl,[28] von Jagic and Klima,[31] Scott[27] and others). Thus, although there is commonly a significantly elevated M-E volume, there may be no significant deviation from the normal maturity dispersion. The diagnosis in an aleukemic state is consequently difficult. Schulten[25] and Barta[2] emphasized the similarity of these marrows to those observed in certain chronic infections. Many toxic-infectious states are accompanied by myeloid hyperplasia with variable degrees of shift to immaturity. Thus such a marrow might be predominantly myelocytic or myelocytic-promyelocytic and indistinguishable from that of a leukemic marrow presenting a preponderance of cells at the same levels of maturation. The fact that infections are frequently accompanied by increased numbers of reticulum cells and plasma cells as well as toxic changes in the leukocytes, features usually absent or less prominent in leukemia, is of aid in differentiation (von Jagic and Klima[31]).

In most cases of acute myeloid leukemia there is a great preponderance of immature forms—myeloblasts (Segerdahl,[28] Schulten,[25] Dameshek[6]). Schartum-Hansen,[23] Scott[27] and others emphasize the frequent abnormal morphological features of these immature leukemic cells. These forms are the paramyeloblasts of Naegeli, micromyeloblasts, monocytoid myeloblasts, etc. Such a marrow is clearly diagnostic irrespective of the blood picture. Klima[15] described three types of marrow in acute myeloid leukemia: (1) hyperplastic with about 90 per cent of the cells at myeloblast level; (2) hypoplastic but with a similar proportion of stem cells; (3) hyperplastic but with variable degrees of immaturity (Fig. 3). Cases in the third group are not rare and offer considerable difficulty in diagnosis. These marrows are again not unlike the hyperplastic reactions to infections. Barta,[2] for example, described marrows with high proportions of stem cells in specific infections accompanied by severe leukopenia. We have observed several cases in which it was extremely difficult to determine whether the findings represented a reaction to an infection, symptoms of which these patients so frequently exhibit, or a leukemia. In one case, with the clinical features of sepsis, in which repeated examinations of the blood revealed only rare immature cells, the marrow showed but little shift in the maturity dispersion and the immature forms were not sufficiently abnormal to be considered diagnostic. The importance of the qualitative features is illustrated by the following case:

A white female infant, five months of age, was admitted to the hospital one month after the onset of a persistent upper respiratory infection and ten days after the appearance of a swelling behind the right ear. The pertinent findings were: moderate pallor, temperature of 101.4°, fluctuant postauricular mass, thick, reddened right tympanic membrane, and palpable liver and spleen. In the peripheral blood the hemoglobin was 52 per cent (Sahli) and red and white cells numbered 2,800,000 and 14,100 per cu. mm. respectively. The post-auricular subperiosteal abscess was drained and a right myringotomy was performed. The hemoglobin rose to 90 per cent following transfusions. Postauricular drainage persisted for a time but the wound finally healed and the fever temporarily disappeared.

At the time of admission the differential count on the peripheral blood revealed 50 per cent lymphocytes, 20 per cent neutrophils and 30 per cent monocytes. Both neutrophils and lymphocytes showed toxic changes. The monocytes were mature although some were atypical. Whether the picture presented was one of a monocytic response to an infection or a monocytic leukemia was uncertain. Aspiration biopsy on the tenth hospital day yielded a cellular sternal marrow with a myeloid maturity dispersion which, although shifted to the left, was not quantitatively significant. There were, however, numbers of abnormal monocytoid myeloblasts. These cells were of variable size, had variable amounts of cytoplasm both with and without azure granulation, and had abnormally lobulated nuclei. Mature monocytes were not found. Toxic-infectious features such as increased numbers of plasma cells and histiocytes were absent. It was believed that although the marrow could hardly be said to present irrefutable evidence of leukemia, the abnormal immature forms, together with the peripheral monocytosis and splenomegaly, justified a diagnosis of monocytic leukemia (Naegeli type). At necropsy, ten weeks after admission to the hospital, the typical findings of myeloid leukemia were presented.

It is evident that the findings in both acute and chronic myeloid leukemia are extremely variable. While the diagnosis in the presence of pronounced changes is readily made, the dividing line between a leukemic and a "reactive" marrow is by no means sharply drawn. Attention to the qualitative features, such as abnormality of the cells, toxic changes, et cetera, is

helpful, but the findings are frequently subject to interpretation, may be justifiably interpreted only in connection with the clinical features, and it may even then be impossible to make a positive diagnosis.

The typical case of lymphatic leukemia with a high peripheral lymphocytosis yields a marrow in which about 90 per cent of the cells are lymphocytes (Segerdahl,[28] Klima[15]). It has been pointed out that under such circumstances it is impossible to determine the proportion of lymphocytes derived from the marrow and diluting sinusoidal blood respectively. When the peripheral blood contains from 10,000 to 20,000 cells per cu. mm. the marrow usually shows from 30 per cent to 50 per cent lymphocytes (Rohr,[21] Klima[15]). Yet in this group as well as in cases without elevated peripheral counts the degree of lymphocytosis of the marrow varies greatly. Scott[27] found from 7 per cent to 97 per cent lymphocytes in cases presenting low to moderately elevated peripheral counts.

Probably most cases will present a sufficiently high proportion of lymphocytes to be considered diagnostic. In these instances the procedure is an easy means of establishing or confirming a diagnosis as illustrated by the following case:

A white woman fifty-one years of age, gave a history of gradually progressive weakness of a year's duration and severe headaches during the last three months of this period. The only significant physical finding, in addition to marked pallor, was the presence of palpable posterior cervical, axillary and inguinal nodes. The hemoglobin was 20 per cent (Sahli); red cells and white cells numbered 990,000 and 4,500 per cu. mm. of blood respectively. There were 70 per cent of lymphocytes and 30 per cent neutrophils by differential count; there were no immature forms and the neutrophils presented a moderate toxic granulation.

Sternal aspiration yielded a cellular marrow completely overrun with uniformly small mature lymphocytes (Fig. 4). This finding, together with the data previously presented, entirely justified a diagnosis of aleukemic lymphatic leukemia.

Cases without significant lymphocytosis in the marrow do occur and a diagnosis on the basis of a sternal biopsy may be impossible. Such instances have been reported by Weiner and Kaznelson,[32] Klima[15] and others. In one of our cases of aleukemic lymphatic leukemia, proven at autopsy, three biopsies of the sternal marrow failed to reveal evidence of the disease.

The degree of lymphocytosis necessary for a positive diagnosis is subject to interpretation. Scott[27] considered 40 per cent lymphocytes diagnostic. It has been noted above that reported normal counts range up to 24 per cent, although few are above 12 per cent. Although a large percentage is necessary for an arbitrary diagnosis, a less marked but elevated lymphocyte count must be viewed with suspicion, and in conjunction with the clinical and other hematological data may at times justify a diagnosis. The differential count alone is of little significance. Scott reported up to 80 per cent lymphocytes in cases of aplastic anemia and the case cited above under that topic is similar. In such instances, however, the lymphocytosis is relative, for the marrow is extremely hypocellular. In the absence of a demonstrable cellular marrow indicated either by large numbers of cells in direct smears or a reasonable M-E volume, a diagnosis of lymphatic leukemia must be made with caution. The qualitative features are also of importance. Small numbers of immature lymphocytes are of greater significance than an equivalent proportion of mature forms. Chronic cases present the same monotonous uniformity of the cells as is exhibited in the peripheral blood. Toxic changes, as noted under myeloid leukemia, are usually absent. Irregular involvement of the marrow undoubtedly accounts for failure to demonstrate the disease in some instances, and when a biopsy in a suspected case gives negative results, repetition of the procedure at a different sternal level may be worth while.

Summary

Sternal biopsy is a useful procedure in the diagnosis of diseases of the hematopoietic system. While in many instances biopsy is unnecessary and can add no information of diagnostic importance, it may be very helpful in obscure cases. The indications can hardly be arbitrarily defined, but biopsy may be considered advisable in any case where a disease of the hematopoietic system is present or suspected and the evidence from other sources does not permit a diagnosis. Biopsy is particularly advisable in obscure anemias, suspected leukemias, thrombocytopenic purpura and agranulocytosis. The findings may or may not be conclusive, are frequently subject to interpretation, and the procedure can by no means be considered to give the final answer to

all hematological problems. An appreciation of its limitations increases the value of sternal biopsy as a diagnostic aid.

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PNEUMONIA IN DULUTH DURING 1939-1940*

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THE mortality from pneumonia is decreasing. The factors responsible for this are not definitely known. Is the widespread use of sulfapyridine responsible? Is the disease changing its form due to alterations in the virulence of the organisms or to increased resistance in the host? Other infectious diseases are also showing lower mortality rates, and one wonders how much is due to improvement in diet, sanitation, housing, etc. Reimann[5] discusses this question but is unable to come to a definite conclusion as to the relative importance of any one of these factors. Chemotherapy, however, must be considered a major determinant.

In order to study the current form of pneumonia and its response to therapy, particularly chemotherapy, a hundred unselected cases occurring in Duluth hospitals† during the 1939-1940 season were reviewed. The clinical records and x-rays were examined so that only those with definite infiltration or consolidation were included. Complicating pneumonias such as postoperative or hypostatic were excluded. The salient features brought out by this study will be presented.

Clinical Features

The monthly incidence was not unexpected, the greatest number of cases occurring during the months of March and April.

The symptoms of the present illness could

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be dated back to an upper respiratory infection in 60 per cent of the cases. In half of these it extended back as far as two weeks. While the individual was suffering from such symptoms as malaise, cough, slight fever, etc., there would suddenly occur a chill with pain in the chest and the actual onset of the pneumonia take place. In 30 per cent of the cases the onset was precipitate without antecedent symptoms of upper respiratory infection.

The appearance of the patients at the bedside was not striking. They usually did not appear profoundly ill and stertorous breathing with marked prostration and dyspnea were uncommon. Abdominal distention was also seen rarely.

Practically all types of pneumococci were encountered in the sputum. Fifty-one per cent had a positive pneumococcus typing, 23 per cent had a negative typing reaction, and 26 per cent were not typed. Of those having a positive reaction, 70 per cent had pneumococci of the "lower types" (I, II, III, VII, and VIII). In view of the 23 per cent who had a negative typing reaction it is probable that some cases are included in this series which are not due to the pneumococcus but to some other organism or virus.

Pathology

The classic pathology of pneumonia consisting of congestion, infiltration, consolidation and resolution is well known. Experimental lobar pneumonia has been produced and the pathogenesis elucidated. The organisms penetrate the bronchial wall and invade the peribronchial lymphatics. Congestion and edema of the peribronchial tissues occurs and the organisms travel peripherally by the peribronchial route until they reach the alveoli. Finally when the organisms lodge in the alveoli a fibrinous exudate is formed and the familiar changes of consolidation are produced. It is seen then that the initial infection begins centrally and spreads out by infiltration. When this spread goes into a single lobe of the lung and the entire lobe becomes eventually involved we have the typical picture of lobar pneumonia. However, if only part of a lobe is involved or if parts of several lobes are involved, the distribution is lobular and the term, lobar, if strictly applied, is incorrect. In the cases studied, all these pathological variations were observed either at autopsy or by radiograph.

The distribution of the lesions was widespread in some cases and so minimal in others that they could scarcely be seen. A single focus of pneumonia was observed in fifty-six cases, two foci in twenty-seven, three foci in eight, four foci in one case and six foci in 1 case. No radiographs were taken in seven cases. So-called migratory pneumonia was seen in three instances. In one of these there was a fatal termination.

Complications were very uncommon and when they did occur were extremely mild. Small effusions were present in five instances. There was one empyema. This was easily treated by repeated aspiration and recovery was uneventful.

Therapy

The treatment of each case was recorded. This was made easy by the fact that 90 per cent of the cases were routinely treated with sulfapyridine, alone, or with the addition of serum, oxygen, x-ray or diathermy. A few were treated with sulfanilamide, neoprontosil and sulphathiazole. The effect on the temperature curve was used as an indicator of the potency of the treatment. Because of the low mortality rate and the relatively small number of cases studied, it was felt that the mortality rate would not be an accurate criterion. No serious or fatal toxic reactions occurred.

Sulfapyridine.—The drug was used in 90 per cent of the cases. It was either used alone or in combination with serum, oxygen, diathermy or x-ray. No essential difference in results was noted whether used alone or in combination. In 75 per cent of cases there was a prompt drop in temperature to normal in one and one-half to two days. In the 25 per cent in which this did not occur the drug was either given in insufficient dosage, the extent of the involvement was very great, or the patient was admitted in a terminal state.

The usual dosage was 2 grams stat. with 2 grams repeated in four hours and 1 gram every four hours thereafter. This was continued until the temperature was normal. At this time the drug was usually stopped and there would result a rebound of the fever with a delayed return to normal. In many instances, especially in those where the fever failed to return to normal promptly, a lower dosage such as .65 grams every four hours or 1 gram every four hours was prescribed. This is considered insufficient dosage by

most authorities. It would appear that the optimal dosage is 2 grams stat. and 2 grams in four hours with 1 gram every four hours thereafter. When the temperature reaches normal, the amount should be decreased to 0.5 gram every four hours, later to 0.5 gram every six hours and finally discontinued. With this method toxic reactions are minimal and no rebound of temperature occurs. Higher dosage is always associated with more reactions and results which are no better.[1] In many cases a smaller dosage will be effective. As with all drug therapy it is probably unwise to adhere rigidly to one definite system of dosage but one should in general give "enough." It is probably safest to drive the temperature to normal as soon as possible and keep it there if this can be accomplished without undesirable reactions. As has already been mentioned, there is a tendency for the pneumonia to become migratory in some instances. The prompt administration of enough of the drug to quickly drive the temperature to normal might prevent this.

Sulphathiazole, neoprontosil and *sulfanilamide* were used in a few cases but the number was so small that no conclusions could be drawn. Oxygen was administered in only eighteen cases, and always with other therapy. This may be an indication of the relatively mild form of the disease present. Diathermy and x-ray were used in eleven instances. They were never used alone but only when other agents failed to bring a rapid favorable response.

Serum—This therapy was used in only eight cases and in these sulfapyridine was also given. There were four cases of Type I, three cases of Type III and one case of Type II. The results of the combined therapy seemed no different from those where sulfapyridine alone was used. It was often noted that by the time the sputum had been typed, serum ordered and sensitivity tests made, the temperature had already fallen to normal because of the sulfapyridine which had been given immediately on admission. Finland[3] recommends the use of serum combined with sulfapyridine and there is experimental work to show the superiority of this over sulfapyridine alone. However, Dowling[2] in a series of 220 cases found a lower mortality when sulfapyridine was used (11 per cent) than when serum alone was used (16.7 per cent). Finland had a mortality rate of 13 per cent for patients treated with serum alone and 15 per cent for those treated with sulfapyridine alone. In the cases that received early treatment Dowling noted a mortality of 10.8 per cent when serum was used and 2.9 per cent when sulfapyridine was used. It is seen that the figures for each type of therapy are almost the same. The good practical results seen with sulfapyridine combined with the inexpensiveness and ease of administration seem to warrant its further routine use.

Mortality

There were five deaths encountered in the hundred patients studied. When one considers the fact that these patients were from all walks of life, both urban and rural, and that they were treated by various doctors in different hospitals, this mortality rate is admirably low. It is also noteworthy that there were no deaths in uncomplicated cases, which were seen early. A brief description of the fatal cases follows:

Case 1.—An eighty-two-year-old male was admitted in a semi-stuporous and delirious condition. Prontosil and sulfapyridine were administered with some difficulty. He died seven days after entering the hospital. The sputum was not typed. Autopsy showed bronchopneumonia in the left upper, right upper and right lower lobes, and a recent embolism in the right lower pulmonary artery. This might be looked upon as a terminal bronchopneumonia but no other disease complicated the picture, except possibly senility.

Case 2.—This patient, a sixty-year-old male, was in extremis on admission and died about twelve hours later. He had a positive Kolmer and Kline blood reaction. No autopsy was obtained.

Case 3.—This patient had a migratory pneumonia. mococcus was recovered from the sputum. There was an old history of pernicious anemia but no anemia was present at this time. She was treated with varying She was sixty-five years of age. A Type XXIX pneuamounts of sulfanilamide, neoprontosil and sulfapyridine. After many febrile recurrences she finally began to improve. This was interrupted by a final rise in temperature with heart failure and death. The autopsy showed a right empyema, a large infarct in the right lower lobe, and an organizing bronchopneumonia throughout various parts of both lungs.

Case 4.—This patient, aged seventy-seven, was admitted in coma. He had in addition to pneumonia, uremia and uncontrolled diabetes. An autopsy showed a bronchopneumonic consolidation in the right and left lower lobes. There was no kidney pathology.

Case 5.—This sixty-year-old male was admitted in a stuporous condition. He had had asthma for many years and had been a heavy drinker. His pneumonia was Type II. Heavy sulfanilamide and serum therapy were given but he died in two days. The autopsy showed consolidation of the right lower lobe, fatty

vacuolization of the liver, grade III and thickening of the basement membrane of the bronchioles.

It is seen that the deaths, at least four of them, might be due to the poor condition of the patient at the time of admission to the hospital. Complicating conditions such as fatty liver, uremia, diabetes, cerebral arteriosclerosis were also factors in the mortality.

Comment

The pneumonia seen in Duluth during the past winter has been of a comparatively mild type. The generally favorable course and mild symptoms in many of our cases suggests the possibility that we are dealing with a different type of disease than that seen formerly or from that seen in metropolitan areas. Murray[4] in Boston has recently described an atypical bronchopneumonia which has some features in common with our cases. He noted that in about 50 per cent there was an onset with symptoms of "flu" or "cold" and about one-fourth had a sudden recent onset. The physical findings in the chest were minimal. Sputum was scanty. There was no tympanites. This syndrome was also seen in many of our patients. A comparison of the x-ray findings also shows some similarities. He noted a lobular distribution with most involvement in the lower lobes but the upper middle and hilar areas were also affected. This we have seen. However, bilateral lesions were only observed in 10 per cent and in our cases they were present in 30 per cent. He found varying numbers of one or more types of pneumococcus but practically none of the "lower types." Seventy per cent of our cases with positive sputum had pneumococci of the "lower types." It would appear that the atypical bronchopneumonia or acute interstitial pneumonia described by Murray and others is not exactly similar to that seen in this locality but some of our cases correspond.

Dowling in Washington, D. C., reported on 232 cases of pneumonia in the 1938-39 season. Of ninety-six patients treated with serum alone there was a mortality rate of 16.7 per cent. Of 136 patients treated with sulfapyridine alone there was a mortality rate of 11 per cent. This includes all cases early and late. Apparently sulfapyridine has a slight lead over serum in therapeutic effectiveness. If only those patients who were treated early are included the figures are 10.8 for the serum-treated and 2.9 for those receiving sulfapyridine. This early treated group probably compares with the type of case observed in our Duluth hospitals. Therefore our mortality is roughly comparable. In the larger cities more late cases are admitted to the hospitals and therefore their mortality rates tend to be greater.

Conclusions

1. One hundred cases of pneumonia appearing in Duluth during the 1939-40 season were analyzed.
2. The disease was of a comparatively mild nature with few complications. The most prominent feature was the tendency for the pulmonary involvement to be of a lobular character, multiple foci being present in nearly half the cases.
3. Sulfapyridine was used in 90 per cent of the cases. As a rule a prompt fall in temperature occurred. When this was not the case insufficient dosage of the drug was usually responsible.
4. There was a mortality rate of 5 per cent.

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HYPOTHYROIDISM IN CHILDREN

Physicians often have difficulty in diagnosing hypothyroidism in children. One of the commonest errors is to think that mongolian idiots are cretins. Many times mongolian idiots referred by practicing physicians to children's clinics arrive with the diagnosis of cretinism. Mentally defective children are often considered to be cretins, solely because of their retarded mental devlopment and particularly if they happen to have a puzzled expression and queer physiognomy. Dwarfism, even if not accompanied by any of the stigmas of hypothyroidism, is often thought to depend on deficiency of the thyroid, probably because hypothyroidism is so well known as a cause of dwarfism. An error which has become common recently is to consider delay in the development of the centers of ossification of the epiphyses as being due to hypothyroidism. This is the outgrowth of the mistaken idea that the thyroid alone governs the maturation of the centers of ossification of the skeleton. The principal difficulty is that the physician is inclined to base the diagnosis of deficiency of thyroid on the finding of one or two suggestive signs. The paper of Wilkins and Fleischmann which appears in this issue of *The Journal* is timely. It indicates the necessity of considering the entire clinical picture from the point of view of both functional and structural changes. Attention is drawn also to the fact that the character and extent of structural changes depend on the time of life when the deficiency occurs and the length of time it remains untreated.—*Jour. A.M.A.,* May 31, 1941.

AN ATTEMPT TO PREVENT POSTOPERATIVE PNEUMONIA WITH A RESPIRATORY VACCINE*

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NUMEROUS measures to reduce surgical risk in intestinal operations have been developed through the years. One of these efforts has been an attempt to prevent infections of the upper part of the respiratory tract. With the advent of cold weather, vaccines of streptococci and pneumococci were administered for several days to a week before undertaking such operations. During the years of this method of treatment singularly few instances of postoperative pneumonia occurred on the intestinal service.

However, in the summer of 1937 postoperative pneumonia developed in several cases while the patients were in a hospital under exceptionally well-controlled circumstances. It had been concluded by various investigators that immunity could be produced in human beings and animals with vaccines prepared from heat-killed streptococci and pneumococci.[1,2,3,7] These investigators felt that protection had been afforded to persons against epidemic infections of the respiratory tract and to animals against inoculation of streptococci isolated in these diseases by the use of composite, relatively nontoxic vaccines prepared with the streptococci and pneumococci concerned. The cataphoretic velocity and pneumotropic virulence of streptococci isolated in studies of the common cold, of influenza and of simple and influenzal bronchopneumonia, as studied by Rosenow, are characteristic and much alike in different seasonal epidemics.[4,5,6] It had been thought that a vaccine prepared from these organisms might afford protection against postoperative pneumonia.

For this reason such a vaccine was administered to patients on whom intestinal operations were to be performed. The patients who were to have such operations received pre-operative preparation on the combined colon service in the hospital for several days. It seemed, therefore, that an excellent opportunity to establish the value of a respiratory vaccine was at hand. A minimum of three pre-operative days to administer the vaccine to the patients was available. The vaccine used was prepared by Dr. E. C. Rosenow from strains of streptococci and pneumococci which had been isolated from patients having acute infections of the respiratory tract, chiefly the autumnal cold and influenza. The vaccine was made to contain 2,000,000,000 heat-killed (70°C., one hour) organisms per cubic centimeter of many freshly isolated strains that had been preserved for some time in dense suspension of glycerol (two parts) and 25 per cent salt solution (one part). Three-tenths cubic centimeter of the vaccine was injected subcutaneously two days before operation, 0.5 c.c. the day before and 1.0 c.c. the day of operation. There was only slight local reaction and no untoward constitutional reaction. The cases were studied postoperatively and the necessary clinical, roentgenologic and special studies were carried out to determine the presence of frank pneumonia.

Because of the variety of intestinal conditions and operative procedures, it was decided that alternate patients should receive the vaccine. This was done by arranging the list of cases scheduled for operation three days hence in numerical order beginning with the smallest clinic registration number. Whether or not the first patient on the list for a given day received vaccine depended on the last patient on the list of the day before. Analysis confirmed the randomness of this sample.

Table I shows the incidence of postoperative pneumonia among patients who had received vaccine and among those who had not received it. Under the conditions of observation as outlined the vaccine did not seem to lower the incidence of frank postoperative pneumonia. We therefore decided to study the characteristics of the group of cases with respect to age, sex and other pertinent factors.

*Work done on Intestinal Service, St. Mary's Hospital, Rochester, Minnesota. From the Mayo Foundation (Tennison, Fellow in Surgery) and the Division of Medicine, The Mayo Clinic (Bargen and Wood).

TABLE I. INCIDENCE OF POSTOPERATIVE PNEUMONIA AMONG PATIENTS WHO HAD RECEIVED VACCINE AND AMONG THOSE WHO HAD NOT RECEIVED IT.

Group	Total cases	Pneumonia cases	Per cent
Vaccine	307	10	3.3
No vaccine	297	6	2.0
Total	604	16	2.6

Table II shows that the "apparently poor" results of giving vaccine occurred chiefly among men. We feel that the result is not significant as only eight cases of pneumonia were involved.

We measured the "vaccine" and "no vaccine" groups separately for the succeeding tables. As there was no difference, we combined the two groups to gain size for the analysis with respect to age, past history of pneumonia and weight of patient.

TABLE II. INCIDENCE OF POSTOPERATIVE PNEUMONIA ACCORDING TO SEX OF PATIENT.

Group	Total cases	Pneumonia cases	Per cent
MEN			
Vaccine	173	6	3.5
No vaccine	161	2	1.2
Total	334	8	2.4
WOMEN			
Vaccine	134	4	3.0
No vaccine	136	4	2.9
Total	270	8	3.0

Only one case of pneumonia occurred among 224 patients less than fifty years of age, an incidence of 0.45 per cent. This case of pneumonia occurred in a patient who was forty-nine years old. Fifteen cases occurred among 380 patients fifty years of age and older, an incidence of 3.9 per cent. This strongly suggests that age is a large factor in the incidence of frank postoperative pneumonia.

A past history of pneumonia was given by eighty-four patients, one of whom contracted pneumonia postoperatively, an incidence of 1.2 per cent. Five hundred and twenty patients gave no past history of pneumonia; fifteen of these contracted pneumonia, an incidence of 2.9 per cent. This suggests that a history of pneumonia does not increase the risk of postoperative pneumonia.

TABLE III. INCIDENCE OF POSTOPERATIVE PNEUMONIA ACCORDING TO WEIGHT OF PATIENT.

Weight group, lbs.	Total cases	Pneumonia cases	Per cent
Less than 100	17	0	0.0
100-109	39	2	5.1
110-119	65	1	1.5
120-129	87	1	1.1
130-139	93	2	2.2
140-149	82	3	3.7
150-159	63	1	1.6
160-169	46	1	2.2
170-179	42	2	4.8
180-189	35	2	5.7
190-199	12	1	8.3
200 and more	23	0	0.0
Total	604	16	2.6

We studied the influence of the weight factor in postoperative pneumonia. Table 3 shows that the patients with higher weights do tend to have slightly higher incidence of pneumonia. However, correlation of age and weight shows that the older age groups are heavier than the younger groups. It would not seem that weight is as great a factor in the incidence of postoperative pneumonia as age.

An analysis of the cases on a time basis revealed two clusters of cases. One centered in October, 1937, and the other to a lesser degree from November, 1938, through February, 1939. We could find no correlation of the cases with personnel either pre-operatively, in the operating room, or postoperatively. Consecutive cases occurred in different wings of the hospital. No common source of the epidemics could be determined except that infections of the respiratory tract were unusually common at the time.

Conclusions

1. Respiratory vaccine administered pre-operatively under the conditions outlined and during the period in which two epidemics occurred did

not seem to reduce the incidence of frank postoperative pneumonia. In consideration of the results obtained by Rosenow and Heilman in the prevention of infection of the respiratory tract in persons not operated on and in animals, with the same vaccines as used in this study, several factors for consideration arise. The period of inoculation before operation may have been too short. Pneumonia developed in a very small number of cases. A negative report of this type does not deny the value of vaccine in the preventive treatment of infections of the upper part of the respiratory tract. Whether or not vaccine affected the severity of the pneumonia is difficult to ascertain.

2. Sex and weight are only slightly, if at all, associated with the incidence of postoperative pneumonia.

3. A history of pneumonia does not appear to increase the risk of postoperative pneumonia.

4. Age has a bearing on the postoperative incidence of pneumonia.

5. The cases occurred in groups, simulating an epidemic pattern. No evidence concerning the mechanism or source of the epidemic could be obtained.

The study strongly suggests that postoperative pneumonia may be seasonal. A careful study prolonged over a period of years might reveal the epidemic character more clearly and point out obscurely related factors. The data at hand do not in any sense deny the value of vaccine in the preventive treatment of infections of the upper part of the respiratory tract; they concern themselves only with the development of frank pneumonia after operation.

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BURBOT LIVER OIL IN THE TREATMENT OF VARIOUS DERMATOSES*

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SINCE the work of Löhr[3,4] many investigators have studied the healing effect of cod liver oil. Its action is unknown but is thought to be related to the presence of vitamins A and D. The oil of the fresh water fish, the burbot (Lota maculota) has a high content of vitamins A and D.[1,2,5,6,7] This fish is found in the United States, especially in the Great Lakes and in the Lake of the Woods.[7] As the potency of vitamins in Burbot Liver Oil (N.N.R.) is at least seven times as great as the standard U.S.P. cod liver oil, it was decided to use this oil in the treatment of various dermatoses.

An ointment† was used containing 80 per cent of burbot liver oil. This concentration of fish liver oil is greater than that of the average cod liver oil ointment. It was used in the treatment of varicose ulcers, echthyma vulgaris, indolent ulcers following surgical procedures and psoriasis.

Varicose Ulcers

Because of the widely variable factors in the course of varicose ulcers, i.e. circulatory status and the local conditions of the tissue, making each case an individual problem, it was decided that a small number of carefully observed cases would be of more value than a large number of cases seen at infrequent intervals. Therefore, ten patients were admitted to the hospital, placed at rest in bed, the affected extremity elevated and the ointment applied to the lesion.

*From the Division of Dermatology, University of Minnesota, H. E. Michelson, M.D., Director, and the Dermatology Service of the Minneapolis General Hospital, S. E. Sweitzer, M.D., Chief.

†The ointment was supplied by the Burbot Liver Products Company, Baudette, Minnesota.

The improvement in each of these ulcers was carefully measured and the patients remained in bed until the ulcers healed. An attempt was made to plot a graph to show the progress of healing, but even with such standard conditions the individual differences were so great that each ulcer was a separate problem.

These patients ranged in age from fifty to seventy-one years and had suffered from recurrent stasis ulcers for ten to forty-seven years. They had been treated by various measures in the Out Patient Departments of the Minneapolis General Hospital and the University of Minnesota Hospitals for a period of at least four months but had not improved.

In view of the great individual differences in these cases it is difficult to evaluate accurately the results of therapy but it can be said that all of the patients improved rapidly with the use of this ointment.

Several of these patients showed remarkable progress.

Case 1.—B. W., aged fifty, a Chinese man, suffered from an eruption of the lower legs for ten years. During this time the skin of the left leg was ulcerated at various times and in spite of treatment two large ulcers had been present for five years. He was admitted to the Dermatology Service of the Minneapolis General Hospital on November 15, 1939.

On the left leg just above the ankle were two large ulcers. The upper one on the external surface of the leg was 9x6.5 cm. The lower ulcer was just above the medial side of the ankle and was 8x5.5 cm. The circumference of the leg just above the ankle was 20.3 cm. The depth of each of these ulcers was about 0.4 cm.

These ulcers had healed forty-seven days after the ointment was applied to the lesions.

Case 2.—G. P., aged sixty-three, a white man, was admitted to the Dermatology Service of the University of Minnesota Hospitals with varicose ulcers just above the medial aspect of both ankles which had been present for twenty years. He had been treated for several months in the Out Patient Department but the lesions did not heal.

The ulcer on the left leg was 3.3x3.7 cm. and that on the right leg, 3.3x3.8 cm. Burbot liver oil ointment was applied on February 3, 1940. On February 16, the ulcer of the left leg was completely healed and on February 27, both ulcers had healed.

The smallest of the ulcers treated were those described in the second case. The largest ulcer in the series was 10x5.5 cm. The average time of healing of these ulcers was thirty-eight and one-half days.

In addition twenty-three cases of varicose ulcer were treated with the ointment in the Out Patient Department.‡ An accurate evaluation of therapy is difficult under these conditions and other measures were used to improve the circulation, but all of these patients improved while using the ointment.

As is found commonly in the treatment of varicose ulcers some of the patients suffered an exacerbation of the dermatitis at the border of the ulcer where the ointment came in contact with the skin. This, however, quickly healed when the application was limited to the ulcerated area. Four of the thirty-three patients developed this dermatitis.

‡Nineteen of these patients were treated in the Surgery Out-Patient Department of the Minneapolis General Hospital, Arnold Zierold, M.D., Chief.

Other Dermatoses

Other dermatoses were treated with this ointment. Six patients with severe echthyma vulgaris of the lower extremities were admitted to the hospital and treated, and one patient with this condition received treatment in the Out Patient Department. All of these ulcers healed rapidly.

Four patients with psoriasis were treated. Two of these improved but later relapsed.

The ointment was also used to stimulate healing in three patients with ulcers following surgical procedures. These ulcers had been slow in healing but following the application of the ointment improvement was rapid and they healed quickly.

Summary

Forty-seven patients with various conditions of the skin were treated with an ointment containing 80 per cent of burbot liver oil.

Satisfactory results were obtained in the treatment of ulcers of the skin.

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COLOCENTESIS—A GLIMPSE OF THE SURGICAL PAST*

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COLOCENTESIS, or deliberate puncture of the colon, is a procedure frequently employed in veterinary surgery to relieve cattle suffering from "sweet clover bloat," a form of tympanitic distention engendered by overindulgence in rich vegetable food. Animals in this condition are so inflated with gas, generated by fermentation occurring within the alimentary canal, that they become unable to stand, topple over and lie helpless on the ground, to die if prompt aid is not at hand. In these circumstances professional veterinarians recommend the insertion of a trocar through the gap between the last rib and the ilium on the left side to allow the gas to escape, but the practical farmer often achieves the same end by performing the operation with no more elaborate instrument than his pocketknife. In either case, the result is dramatic; gas issues from the wound in large quantities, the distended abdomen wilts and slowly returns to normal proportions and the animal is able to rise to its feet and resume its usual activities as if nothing untoward had happened. There are no unwelcome after-effects and cases have been recorded where particularly gluttonous calves have been punctured as many as twelve or fourteen times without mishap.

An onlooker could not fail to be impressed by this spectacular sequence of events wherein a seemingly moribund animal is restored to its pristine health, in a matter of seconds, by a relatively simple procedure, and it is not surprising that Clifford Allbutt[1] should have retained vivid memories of it from boyhood days spent in the country, and in later years have come to consider the possibility of employing a similar method for the relief of human suffering. The opportunity arose in 1869 when he was called in consultation by his colleague, Mr. Bradley, in the case of a laborer who had been admitted to the Leeds Infirmary as suffering from "obstruction of the bowels." His examination revealed that, although the bowel symptoms were the more prominent, they were caused by a reflex paralysis secondary to bilateral lobar pneumonia. The customary therapeutic measures, subcutaneous injections of morphine, and large enemas both with, and without, turpentine and castor oil had failed to give relief. The distended abdomen caused intense anguish, the extremities were cold, the pulse was small and quick, and the expression anxious. No feces had passed from the bowel for at least five days and no flatus for two.

Allbutt prescribed an injection of a quart or more of warm gruel to be administered slowly through a long tube and followed by an injection of half a pint of warm olive oil, in the hope that the oil might rise through the gruel and reach the obstruction. Belladonna liniment was also to be applied externally to the abdomen and the injections of morphine were to be continued. Although the liniment did have some effect in modifying the general discomfort, the injection of more than three pints of fluid was followed by the discharge of neither feces nor flatus. The patient spent a wretched night and the next morning his abdomen was even more distended and he hiccoughed continually.

"The previous evening," wrote Allbutt, "I had been much tempted to puncture the abdomen with a fine trocar, and in the morning the desire strongly returned." It was in this state of mind that he encountered the celebrated surgeon Teale who was also making rounds in the hospital that day. Laying the facts of the case before his colleague he asked him if he would care to perform the operation. Mr. Teale willingly consented and, producing a fine Weiss trocar from his pocket, he plunged it straightway in the distended transverse colon. A hissing sound heralded the escape of a vast quantity of malodorous gas, and a second puncture, this time in the descending colon, completed the deflation of the abdomen. The patient expressed great relief and thanked his benefactors warmly. His face grew calm and he breathed comparatively easily and soon fell into a quiet sleep. Aided by injections of morphine and soothing poultices, he passed a comfortable night and awakened refreshed on the following day. To his great delight he found that his bowels had regained their activity and he was able to pass large quantities of flatus and abundant stools. It is regrettable that in this case the pul-

*From the Mayo Foundation (Cromar, Fellow in Surgery) and the Division of Surgery, The Mayo Clinic, Rochester, Minnesota (Mayo). Submitted for publication October 1, 1940.

monary consolidation spread and caused the death of the patient two days later, but it is of outstanding interest that postmortem examination of the cadaver revealed no trace of peritonitis and no sign of gas in the peritoneal cavity, and most significant that the sites of puncture could not be detected except on the outside of the body.

The publication of this case was followed shortly by an article by Dr. James Davey[16] of Bristol which revealed that at his suggestion Mr. Salmon of Thornbury had performed a similar operation in the previous year (1868) on a girl of nine years suffering from tuberculous peritonitis. As the disease approached its terminal phase the child became progressively emaciated and her abdomen was hugely distended. Palliative measures were of no avail, and realizing the desperate nature of the case Davey decided that it would be wisest to puncture the abdomen to relieve the distention. "The enormous quantity of gas or wind occupying the peritoneal sac, or it might be, the intestines, being nothing more or less than a foreign body, or at any rate, a product of abnormal action in the parts concerned, should be evacuated." This was the proposition he made to Mr. Salmon as they drove home together after the consultation. Mr. Salmon was not convinced, and so to support his contention Davey developed his argument to a further stage by maintaining that if instead of air they felt assured that there was fluid or water (ascites) within the abdomen an operation would surely be held to be imperative. This Mr. Salmon could not refute, and on the following day he performed the operation. The abdomen was punctured letting out an immense quantity of gas, which continued to discharge at intervals until the patient's death two weeks later. Mr. Salmon commented that "the operation gave great relief, and tended much to mitigate her suffering, previously to which the difficulty of breathing had been most distressing." Necropsy showed typical tuberculous peritonitis with deposits of lymph, adhesions, purulent effusion, and so forth. In addition there were three ulcers of the bowel, one of which had perforated, allowing feces to escape into the peritoneal cavity. This perforation, however, was nowhere near the site of the puncture.

Another protagonist of colocentesis was Dr. Fonssagrives[22] of Toulouse. In the *Medical Press and Circular* of April 7, 1869, it is recorded that by his advice intestinal puncture had been practiced "as a last resource" on two patients suffering from tympanites. The abdomen of the first of these was so swollen with gas that the patient was deeply cyanosed and on the brink of suffocation. An exploring trocar was inserted into the most distended part of the lower umbilical region and the gas escaped violently. The next day, as the distention had returned, two fresh punctures were made in different places and gave so much relief that the life of the patient was prolonged for four days. In the second case, six successive punctures restored to the patient the power of passing flatus naturally and thus effected a complete cure.

The following year, the operation was reported by Mr. Hancocke Wathen[45] of Fishguard. On reading of Allbutt's case he had decided to try the procedure himself in the first suitable case which came his way. His patient, a woman of twenty-nine years, was suffering from a fulminating acute peritonitis. She presented all the appearances of severe shock and her abdomen grew large and tympanitic. The usual palliative procedures produced free fecal evacuations but gave no relief from the distention. The patient rapidly became exhausted, and three days after the onset of the disease she expressed her willingness to submit to colocentesis. Using a No. 1 hydrocele trocar, Mr. Wathen punctured the transverse, the descending and lastly the ascending colon. A candle held near the scene of operation was extinguished by the force of gas escaping from the first two punctures. Great relief was expressed by the patient but her general condition was unsupportable and she gradually grew weaker and died the next day. Permission to hold a postmortem examination was not obtained.

Mr. Wathen[46] also referred to a case which had occurred in the practice of his friend, Staff-surgeon J. R. Thomas,[43] on the West Coast of Africa. The patient, an American, was smitten with chronic dysentery accompanied by a gradually increasing tympanites which eventually became intolerable and made him beg for relief by any means possible. Puncture of the transverse and ascending colon was practiced "with the best result" but unfortunately a few days later the patient, who had been up and about, "went in for a heavy debauch" and suffered a relapse which terminated fatally.

In October, 1871, Allbutt[2] announced that since

his first venture he had himself performed colocentesis four times, "deeming it as venial an operation for a physician as the injection of morphia." He had used the Weiss No. 1 exploring trocar, which he now carried in his bag for that purpose, on three occasions, and his morphine needle twice. He regarded the trocar as being as innocuous as the needle and believed that it possessed the advantage of allowing the more rapid escape of gas. His individual cases are interesting.

In the first case the patient, an old man and a stranger to Leeds, had been taken ill suddenly in a second-rate lodging house of that city. Allbutt, summoned hastily during the small hours of the night, found him suffering from pneumonia, with severe orthopnea, an intermittent laboring pulse and a dusky complexion. His chief distress was the enormous distention of his bowel which pressed on his diaphragm and embarrassed his elderly and degenerate heart. The colon was punctured twice; gas rushed from the cannula with great violence and in a few minutes, revived by a dose of ether in hot brandy and water, he was able to lie down in peace. Some weeks later Allbutt was gratified to receive a letter posted from a distant village in Yorkshire in which the patient enclosed his fee and affirmed that his life had been saved by this timely intervention.

Another case of heart disease in which sudden and intense tympanites threatened to kill the patient was treated successfully by puncture of the colon, the patient's life being prolonged for weeks or months by the operation. Temporary relief was afforded to two patients with paralytic distention of the bowel developing in the course of febrile illnesses but both died subsequently from the severity of the causal disease.

The publication of these cases aroused a lively interest in colocentesis and the literature of the period contains frequent references to this type of procedure. It became apparent moreover that it was not altogether such a novelty as had been supposed. Dr. Symes Saunders[37] not only provided this evidence but was able to endow the operation with a respectable historical background. He declared that the first man to use the trocar successfully in the treatment of tympanites was François de Paule Combalusier,[40] who is said to have performed the operation as early as 1754. Saunders suggested that the procedure may have evolved from the practice of "needling" the bowel during the operation for hernia, as advocated by Ambroise Paré, Corneille de Soolingen, and Pierre Dionis, and he drew attention to a passage in Heister's[27] "Surgery," where it is recommended that in pneumatocele or "hernia flatulenta," if ordinary remedies have failed, the scrotum should be perforated with a trocar, "which will demonstrate whether it was wind or water."

By the beginning of the nineteenth century the operation of colocentesis had achieved recognition by the standard textbooks of the day. Benjamin Bell,[5] observing that the operative danger was slight in lower animals, advised that the intestine should be punctured in tympanites, and Callisen,[10] in his "System of Surgery" (1813), approved its use as a palliative in this condition. Charles Bell,[6] on the other hand, did not favor the operation, and said so bluntly. Zang,[49] giving precise instructions as to operative details, recommended that a long trocar should be introduced to a depth of 4 or 5 inches at the midpoint of a line extending from the foremost extremity of the second false rib on the left to the anterior superior iliac spine on the same side. At this site he believed it was possible to penetrate the descending colon without injury to its mesentery. He considered the operation to involve no more danger than simple puncture because, after withdrawal of the cannula, the wound in the intestine did not exceed half a line in extent. Roche,[35] writing in 1835, stated that, as a last resort, the abdominal wall may be punctured, and although he regarded the operation as dangerous he appreciated that it had been practiced a number of times with success. The 1852 edition of Chelius's[13] "Surgery" advocated paracentesis in distention of the alimentary canal when the ailment is idiopathic and not a symptom of other disease.

Although these observations are of great interest, their value is chiefly historical, for they contain no record of the cases in which the procedure was actually employed. The earliest case of which we have accurate details was published by Sir Henry Cooper[14] of Hull in 1857. Calling to see a woman of thirty-four years with complete intestinal obstruction caused by an inflammatory process, which occluded the ascending colon, he elected to puncture the cecum. The needle was left in place to allow the lymph to seal off its track and so prevent possible spread of

infection. The escape of flatus was followed by fluid feces and at the end of three days the needle was withdrawn and replaced by a gutta-percha tube which served to keep the wound open. The feces were kept soft by the exhibition of saline laxatives, and thirteen months later the patient was reported as being alive and well. She still used the puncture wound as a cecal outlet, no feces having passed from the anus since the operation.

The peculiar dietetic habits of the South Americans are reflected in a report by Olivieri[32] in 1861 of a series of cases, which savors almost of veterinary practice. He performed colocentesis in twenty cases in which the symptoms were those of abdominal distention caused by overloading the stomach with half-cooked vegetable food washed down with badly fermented liquor prepared from maize. Eight of the patients recovered in three weeks but the remainder died because treatment had been delayed until too late.

The first mention of the operation in the North American literature is to be found in Dr. Gross's[26] well-known "System of Surgery" published in 1866. Here, he described the case of a man with a perforating scirrhus of the sigmoid colon. The prognosis was hopeless from the start but great symptomatic relief was conferred by colocentesis and the patient's life was prolonged for some three weeks. The author was enthusiastic in his recommendation of the operation.

Reports published in France in 1871 state that Boinet[8] had frequently punctured the bowel as often as five or six times in one month without harm to the patient. The secret of success, he said, was to use a fine needle. Tarnier[42] reported several cases of internal strangulation which he had treated by this means. Desnos and Chalvet[18] successfully relieved a patient of hysterical tympanites by aspirating the distended bowel and, despite the fact that feces were withdrawn, no ill effects ensued. Puncture of the bowel was also tried for the relief of strangulated hernia and successful examples were recorded by Duplony,[21] Dugue[20] and Giraldes.[23] The greatest significance of this adaptation, however, lies in certain experimental observations which evolved from it. Dolbeau[19] reduced a strangulated hernia by tapping the trapped bowel, the first puncture yielding liquid feces and the second, reddish fluid. The patient died next day of heart disease and an opportunity arose to examine the loop of the bowel which had been punctured. It looked perfectly healthy and the puncture wounds could not be discovered. Even when it had been inflated with air under pressure it remained impervious and not one bubble of air escaped. In a thesis by Autun,[4] he described several experiments on rabbits in which he pierced the intestines in various directions without any ill effects to the animals.

The popularity of colocentesis grew rapidly among surgeons throughout the civilized world and its results were acclaimed with enthusiasm. Sir Howard Marsh[30] reported "great relief" and subsequent recovery; Lawson Tait[41] cited "numerous punctures for days on end" without adverse effect. Godfrey[24] of Chicago claimed to have cured a case of suspected intussusception by puncturing the abdomen in both iliac fossæ and drawing off a pint of feculent fluid. Wentscher[47] recorded cure of ileus by puncturing the colon in the left nipple line above the navel. Martyn[31] of Bristol overcame an obstruction in the sigmoid by repeatedly tapping the descending colon with a trocar.

McGown[28] of Glasgow pierced the transverse colon of a patient in the throes of acute obstruction from an intussuscepting lesion in the left portion of the colon. Here are his words: "But now comes the wonderful part of the case. Three hours after the operation the patient had a very copious discharge from the bowels of dark clayish liquid feces, followed by a second an hour after the first. Seven hours after the operation a large quantity of gas was passed PER ANUM, and the next morning the abdomen was quite flat and the distention completely gone. The kidneys now began to act vigorously. The ordinary chamber utensil was filled three times in sixteen hours, and at the end of three days all the edema of the limbs had disappeared. The heart's action was now greatly increased; the pulse rose from 48 to 70 per minute. The patient has improved every day since the operation and is gaining flesh rapidly. . . . I look upon this case," he continued, "as one of the triumphs of surgery; and should a similar case present itself to any of my medical brethren, I hope they will not hesitate to give their patient immediate relief and the chance of complete recovery by the operation of Colopuncture."

Several authors claimed to have attacked the

small intestine with no less success. Thus Demons[17] of Bordeaux cited the case of a woman with a pelvic abscess and symptoms of intestinal obstruction which he treated by multiple punctures on six successive days until finally the abscess localized in the left fornix and it became possible to drain it by surgical means which also gave relief of the obstructive symptoms. In a case of obstruction occurring in the ileocecal region, Perry[34] recorded that he punctured the ileum and left the trocar in place for three to four hours until a large quantity of gas and a quart of fecal matter had been evacuated. The nausea and vomiting were reduced "as if by magic" and the distention was much relieved. Bell[7] of Edinburgh, commenting on a case of volvulus, in which the symptoms of abdominal distention had been mitigated temporarily by puncture, asked, "can we relieve this distention easily, painlessly and safely?" "I believe we can," he answered, "in the simplest manner, by tapping the bowel with a fine exploring needle." Rosenbach,[36] too, recognized the value of puncture as a palliative procedure and recorded four cases in which he had performed it successfully.

Colocentesis as a means of reducing distention preliminary to major abdominal operations has been employed on several occasions and cases reported by Pearse,[33] Cutler and Homans,[15] Sheen[38] and Frank L. Smith[39] indicate that in this capacity it met with a fair degree of success. It is interesting to note that in many of these cases the bowel had been subjected to the most drastic forms of therapeutic abuse before the puncture was finally performed. In Smith's case, for example, the patient had been treated with Clutterbuck's elaterium, pil. podophyllin co., croton oil and massive doses of belladonna by mouth, and mustard water, the long tube and even the pole of a galvanic machine had been introduced into the rectum in an endeavor to overcome the obstruction without resorting to operation.

As an aid to pre-operative diagnosis, aspiration of the colon was recommended by Maclaren[29] of Carlisle. "In the aspirator," he wrote, "we have an instrument which will determine whether any given portion of the colon contains liquid or not. If it does it is of necessity above the seat of stricture." Amussat[3] suggested that by puncturing the bowel and thus reducing the distention it might be possible to feel an otherwise impalpable lesion but he added that in his experience he had never had occasion to resort to this expedient.

The most ingenious modification of colocentesis is that described by Chadwick[11,12] of Boston. He had tapped the colon of a woman of thirty-two years in whom peritonitis had developed following ovariotomy, and the release of abdominal distention had given much relief at the time although her poor general condition arising from a habit of "free indulgence in spirituous liquors" had militated against a successful recovery. In reviewing this case he conceived the idea that it might be possible to inject some stimulant into the intestine after the gas had escaped. He believed that by this means the patient's strength might be sustained at a time when nothing could be kept in the stomach and absorption by the rectum was too slow to satisfy the needs of the body. He also wondered whether it might be possible to stimulate peristalsis by the injection of suitable liquids into the lumen of the bowel. The test was carried out on a young woman in whom peritonitis and ileus had developed following a complicated labor. When flatulent distention became so great as to impede her respiration, the smallest trocar of Potain's aspirator was introduced through the abdominal wall into what appeared to be the transverse colon or sigmoid flexure. A rubber tube attached to the cannula led by its other extremity to a basin of water, so that the escape of gas could be noted by the steady rise of bubbles in the water.

After a large amount of flatus had escaped, the tube was pinched, a syringe was connected to its end, and an attempt was made to inject beef tea into the intestine. The cannula became plugged by little shreds of meat which were floating in the liquid and the injection was thereby rendered impossible. As it would have taken considerable time to strain the fluid and this would have added to the mental agitation of the patient, a solution was made up of "very choice rye whiskey" in three parts of water and this was injected instead. The injection was successful, but the very first drops of the fluid gave the woman so intense colic—referred to a spot below the point of the injection—that it was stopped at once, for fear that the intestinal wall had dropped off the end of the cannula and that the whiskey had been allowed to enter the peritoneal cavity. As the pain soon subsided, the injection was resumed, with similar effect, ex-

cept that the pain was less acute and produced a sensation described as a "burning." It was not deemed justifiable to subject the patient to further suffering, and accordingly the experiment was abandoned after it had been definitely established that the cannula was still in the intestinal lumen, by allowing more gas to pass off before it was withdrawn.

The woman continued to complain of intermittent lancinating pains running down to the groin and these were clearly the result of peristaltic action. As this excessive peristalsis seemed undesirable in view of the inflamed condition of the intestines, a quarter of a grain of morphine was administered hypodermically. Ten minutes later the patient complained "that something was about to pass from the bowels." Digital examination revealed the presence of two large scybala in the rectum which had previously been empty, although not even flatus had escaped during the previous twelve hours. She died of septicemia two days later and no necropsy was allowed. At the conclusion of his paper Chadwick stated: "as a means of exciting peristaltic action, my procedure was eminently successful. The extreme sensitiveness of the intestinal mucous membrane to the contact of an alcoholic fluid so dilute as not to produce any astringent sensation in the mouth or rectum is worthy of note."

In a lecture to the students of Guy's Hospital on the subject of intestinal obstruction, Goodhart[25] drew attention to the danger of fecal contamination of the peritoneal cavity as a result of colocentesis, stating that he had seen a case in which fecal matter had escaped from the cannula, no relief had followed and the patient had died. We have been unable to find a case of this type anywhere in the literature but this may be explained on the basis of the infrequency with which failures find their way into print. At the time of publication Goodhart's warning did not pass unchallenged but was heartily contested by Mr. Alfred Sheen[38] of Cardiff. "I certainly cannot see the force of Dr. Goodhart's argument," he said. "I would submit, that as the gas escapes from the distended intestine the latter contracts and the arrangement of the muscular fibres of its coat would surely prevent the escape of its contents into the abdomen where such a small opening is made." This hypothesis is borne out by the experimental evidence which we have already quoted, and also by observations made on material obtained at necropsy. It is further confirmed by the statement of Maclaren who attended the postmortem examination of a case in which the aspirator needle had been pushed into various portions of the bowel during the six hours preceding death and was unable to find any traces of its use. Certain writers have described cases in which peritonitis followed attempts to aspirate the contents of a strangulated hernia, but it can be readily appreciated that in this condition the bowel may be so devitalized as to be incapable of sealing off the wound made by the needle.

It is true that complications directly attributable to puncture for tympanites have been reported, but in the absence of strangulation—these have been few in number and relatively insignificant in effect. Broadbent[9] punctured the small intestine in obstruction caused by adhesions to an ovarian cyst. As the gas was escaping, the patient coughed and the intestine became displaced. The needle was rapidly withdrawn but a small amount of subcutaneous emphysema developed. This subsided completely in the course of time and no harm resulted. Worthington[48] described a case in which the transverse colon had been punctured; air escaped, followed by fecal fluid; the cannula then became blocked and had to be cleared with silver wire. The patient's temperature rose to 100.2° F. that night but had dropped to 99° F. by the next morning. A little local tenderness was experienced at the site of the puncture but it dispersed in two or three days. Wagstaffe[44] recorded that he successfully relieved an obstruction in a somewhat irresponsible young Irish physician by tapping his bowel. Four days later this gentleman rather imprudently elected to rise from his bed of sickness and go out for an hour's walk. In consequence some local peritoneal irritation developed but this also cleared up satisfactorily in a few days.

The weight of evidence therefore suggests that colocentesis is a relatively safe procedure and that, in addition to the ability of the bowel to seal the puncture rapidly, the peritoneum is well equipped to deal with any leakage which may occur. Certain precautions however have been suggested in order to make the operation even safer. The importance of tapping a coil of bowel which contains gas rather than feces has been stressed by Broadbent who has also drawn attention to the danger of tearing the bowel if care

is not taken to insert the needle at the point of greatest convexity of the distended loop. Should the needle become blocked, it is wiser to clear it by injecting air rather than by suction which might cause damage to the mucosa of the opposite side of the lumen of the bowel by drawing it against the sharp point of the needle. To prevent the escape of fecal contents from the cannula while it is being withdrawn, Wagstaffe suggested that a finger should be placed over the end of it to exclude the influence of atmospheric pressure. Perhaps this danger is more theoretical than real, for, in several of the reported cases, fecal material was withdrawn through the cannula and no complication ensued.

When, at the end of the last century, Lawson Tait demonstrated to the world that the abdominal cavity could be explored with relative impunity, intestinal obstruction became a major surgical emergency which demanded immediate laparotomy to enable the surgeon to see and cope with the actual cause of the obstruction. The older methods were discarded, and such remedies as O'Bierne's tube, Simon's procedure and a host of other examples of the ingenuity of a bygone generation were consigned unceremoniously to the scrapheap. With them went colocentesis, and condemned by common vote as "enterostomy performed in the dark," it thus slipped quietly out of the practice of surgery.

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GUARDING THE SUPPLY OF HELIUM

The U. S. government's helium plant in Texas is the world's sole producer of helium. About 15 per cent of the output of the plant is sold for medical, scientific and commercial use, the other 85 per cent of the output being supplied directly to the government. At the current rate of production this plant will produce by the end of the fiscal year about 14,000,000 cubic feet of helium. The plant has produced more than 110,000,000 cubic feet of helium since it began operations about twelve years ago. There are proposals now in Congress to increase both the well and the plant capacity. Measures are being taken to insure that no interruption in operation shall occur. Dr. R. R. Sayers, director of the Bureau of Mines, reported to the Secretary of the Interior that steel guard towers are being constructed at strategic points. A tower is being erected also in the gas field from which a general view of the government's helium properties can be obtained.—*Jour. A.M.A.*, May 17, 1941.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL
Frank C. Andrus, Pathologist

The case is that of twenty-seven-year-old woman who was admitted to the hospital on April 15, 1941, and expired seven days later. Her present illness began on April 6, 1941, when she noted a sore throat. Her temperature was 102 degrees. She went to bed and remained there. On April 9, 1941, a nose and throat culture was taken which was negative for diphtheria bacilli. On April 10 the patient developed marked laryngitis, and on April 11, she coughed up several small pieces of what appeared to be a membrane. During this time, the patient's oral temperature had been ranging from 102 to 104 degrees and her throat was extremely sore. On April 12 she was admitted to a private hospital. Nose and throat cultures were repeated and were again negative. On April 15 the cultures of the nose and throat were positive for the first time and she was transferred here. Past history was negative. She was married and had three children who were living and well. Her youngest child was admitted to the hospital at the same time as the mother, also suffering from a sore throat. The cultures from the child's throat yielded diphtheria bacilli.

Physical examination on admission revealed an oral temperature of 101 degrees, a pulse rate of 115 per minute, and respirations of 24 per minute. The patient was well developed and rather obese. She did not appear to have any respiratory distress. There was a rather marked facial flush. Examination of the eyes, ears and nose revealed no abnormalities. Examination of the throat revealed a thick, dirty, greyish membrane covering the tonsils, uvula, and the pharynx. A slight amount of bleeding was noted at the margins of the membrane. There was moderate enlargement of the anterior and posterior cervical lymph nodes. The lungs were clear to percussion and auscultation. The heart showed a normal sinus rhythm and no murmurs were heard. The abdomen and extremities were negative. She was having fairly marked difficulty in speaking at this time and the impression of the staff was that she was suffering from pharyngeal and laryngeal diphtheria.

The hemoglobin was 92 per cent with a leukocyte count of 15,000 of which 83 per cent were polymorphonuclears, 14 per cent lymphocytes, and 4 per cent monocytes. Examination of the urine revealed the specific gravity to be 1.029. It contained four plus albumin, occasional granular casts, many red cells (menstrual blood), and occasional white cells in a non-cathetrized specimen. A nose and throat culture was negative. A guinea pig was inoculated from a culture and while it became sick, it recovered. On the day of admission, the patient was given 40,000 units of diphtheria antitoxin intramuscularly and 40,000 units intravenously. On the evening of the same day, she coughed up a cast of the trachea, larynx, and a good portion of the bronchial tree. Diphtheria bacilli were found on direct smear of this membrane. On April 16, at approximately 12:15 a.m., the patient had a severe coughing spell and coughed up a thick piece of membrane measuring 2 x 1 inches. Again, following a severe coughing spell, at 4 a.m. on April 16 she coughed up another piece of membrane measuring 1 x 1 inches. Later in the morning of April 16, the patient appeared to be much better and stated that her throat was less sore. Her temperature had fallen to 100 degrees.

On April 17 her temperature was 105.4 degrees by mouth. She suddenly became very listless, her pulse very thready and 140 per minute. There was no respiratory distress but her lips and fingernails were cyanotic. The heart tones were barely audible, but there was no irregularity. The blood pressure was 80/60. Examination of the chest revealed coarse rhonchi throughout both lungs. There were, however, no areas of dullness. Numerous petechiæ appeared over the right flank and upper chest. The impression at this time was that the patient now had a diphtheritic myocarditis. On April 18 the patient's temperature had fallen to 102 degrees and her pulse rate to 120 per minute. She appeared to be much better. An x-ray film of the chest revealed a complete consolidation of the right upper lobe. There appeared to be some atelectasis along with the consolidation. There was also some increased density in the para-hilar region on the right side and in the lower half of the left lower lobe. A blood culture taken at this time was negative. On this day, April 18, the patient received a total of 660 c.c. of fluid but she had no output of urine. An effort was made to type the sputum but no pneumococci were found. The sputum was inoculated into a mouse but its peritoneal fluid was sterile at the end of seventeen hours. On April 18, she was given four grams of sodium sulfathiazole intravenously. This was followed by one gram intravenously four hours later. Her respirations were very rapid and shallow. She appeared to be quite comfortable; her color was good. The pulse was fairly strong but it was now markedly irregular. For the first time, a one plus pitting edema was noted over the tibial regions. The venous pressure was 15 cm. of citrate solution. Urinalysis now revealed the specific gravity to be 1.022. The urine contained four plus albumin and occasional red and white cells. The patient developed a pharyngeal paralysis. It was

thought that the edema and the irregular pulse were due to diphtheritic myocarditis. Because of the severe oliguria, it was considered necessary to give the patient additional fluids in spite of the probable heart failure. The sodium sulfathiazole therapy was discontinued because of the oliguria and the fact that no pneumococci could be isolated in the sputum or on mouse inoculation.

In the evening of April 18, an electrocardiogram revealed slight slurring of the QRS complexes in all three leads, a sinus tachycardia, and occasional ventricular extrasystoles. On April 19 the patient's temperature ranged between 100 and 101.5 degrees and her pulse between 110 and 120 per minute. She was given 2000 c.c. of 10 per cent glucose intravenously at a very slow rate and her total intake for this day was 2830 c.c. Her output, however, for the twenty-four-hour period was only 200 c.c. This urine had a specific gravity of 1.023, contained four plus albumin, and occasional red and white cells. The patient appeared extremely toxic and her respirations were gasping in character. The pulse was of a fairly good volume but was again noted to be irregular. Moderate edema was noted over both extremities and over the sacrum. Examination of the chest on this day revealed consolidation bilaterally. An electrocardiogram was repeated and revealed extra-systoles occurring as a pulsus trigeminus. The P-R interval varied between .14 and .16 seconds. Otherwise, there was no change from the previous tracing. The blood urea nitrogen was 103 mg. and the creatinine 5 mg. per cent. The carbon dioxide combining power was 38 volumes per cent. Blood pressure determinations during the day of April 19 were 96/60, 98/65, and 104/68. The patient's temperature was 100.4 degrees on April 20 and her condition appeared even more critical than previously. Her respirations were very rapid and shallow but she responded quite well. The cardiac decompensation did not appear to be any more severe. The petechiæ seemed to be disappearing. The pulse rate was now regular at 100 per minute and of good volume. She received 1000 c.c. of fluid intravenously during this twenty-four-hour period, this being her only intake. Her urinary output was 425 c.c. Examination of this urine revealed a specific gravity of 1.022, three plus albumin, many granular casts, 10 to 12 red cells, and numerous cellular casts. The question of acute glomerular nephritis was now raised. During the evening of April 20 she suddenly became very dyspneic and was given a BLB mask with 100 per cent oxygen. The dyspnea seemed to improve under this therapy. On April 21 very little change in her condition was noted. The heart tones were quite loud and there were occasional extrasystoles. No murmurs were heard. However, her pulse rate varied as much as 40 beats within a period of five minutes. Her fluid intake was 1000 c.c. intravenously and her output was 750 c.c. Examination of this urine revealed the same findings as before. Her blood urea nitrogen was now 81.6 mg. per cent. On the evening of April 21 her temperature became elevated to 103 degrees and her respirations to 56 per minute. The pulse rate was 120 per minute although it would vary considerably in rate within a few minutes. On the morning of April 22, the pulse rate seemed somewhat stronger although it was still quite irregular. The patient was very restless, cyanotic, and her respirations were 54 per minute. Her pulse gradually became weaker, her temperature became elevated to 106 degrees and she expired.

Clinical Diagnoses: Pharyngo-laryngo-trachea-bronchial diptheria, myocarditis, pneumonia, possible acute glomerulonephritis.

Anatomic Findings (Dr. Martin Buehler):

The body is that of a well developed and rather obese white woman. There are numerous small, scattered petechiæ over the lateral sides and the anterior surface of the chest, the upper arms, and the abdomen. The mouth contains a quantity of dried blood. There is a one-plus pitting edema of the ankles, the pre-tibial regions, and the sacrum. There is cyanosis of the fingernails and the lips.

The heart weighs 280 grams. The heart muscle shows cloudy swelling, the myocardium being pale and flabby. The valves of the heart are entirely normal. The coronary arteries are normal.

The right lung weighs 1220 grams and the left lung weighs 940 grams. There is a complete, red consolidation of the entire left lower lobe and the superior three-quarters of the upper lobe of the left lung. These portions of the lung are entirely airless and solid. A profuse bloody discharge is easily expressed from the cut surface. There is complete consolidation of the entire right upper and lower lobes and one-half of the right middle lobe. The bronchi are traced to their terminal branches and all are filled with bloody, frothy fluid. There is, however, no evidence of any membrane at this time.

The liver shows a minimal degree of chronic, passive congestion.

The right kidney weighs 240 grams and the left kidney weighs 220 grams. Both kidneys reveal cloudy swelling. The cortices and pyramids appear normal.

A hemorrhagic, pseudo-membrane is noted in the trachea and in the larynx. There are a few mediastinal and paratracheal enlarged lymphnodes.

Discussion

Dr. Frank C. Andrus: Microscopic study of the kidneys reveals only cloudy swelling and albuminous casts in the tubules. There is no visible glomerular change. The uremia is probably partly due to the fall in blood pressure.

The myocardium shows an acute, exudative, interstitial myocarditis. The trachea and larynx have the characteristic changes of diphtheria, part of the membrane being still present.

The lungs show a well-marked pneumonia of the type often seen due to streptococci. With all of the denuded surface of the trachea and bronchi, it is easy to postulate a portal of entry.

Anatomical Diagnoses: (1) Pharyngo-laryngo-tracheo-bronchial diphtheria; (2) Acute exudative myocarditis; (3) Myocardial failure, mild; (4) Pneumonia, probably streptococcic; (5) Cloudy swelling of liver, heart, and kidneys.

Dr. Edward L. Strem: From January 1, 1934, to the same month of 1941, there have been 161 cases of diphtheria of all types treated in this institution. In reviewing the records of these patients, it was found that the age distribution ranged from early infancy to late adult life (Chart I). Of the entire group, 45 per cent were children from eight months to fifteen years, and the remaining 55 per cent were individuals from fifteen to sixty-seven years.

TABLE I. THE DIFFERENT TYPES OF DIPHTHERIA ENCOUNTERED AND THEIR INCIDENCE

Type	*Number of Cases*
Pharyngeal	128
Laryngeal	14
Pharyngo-laryngeal	13
Naso-pharyngeal	3
Nasal	1
Naso-pharyngo-laryngeal	1
Diphtheritic balanitis	1
TOTAL	161

The most commonly encountered type of diphtheria was that involving the pharynx. Next in frequency were the laryngeal and pharyngo-laryngeal types. These three comprised 155 of the total number. Their incidence is shown in Table I.

There was a history of previous attack of diphtheria

TABLE II. COMPLICATIONS OBSERVED IN 161 CASES OF DIPHTHERIA

Complication	*Number of Instances*
Myocarditis	7
Pneumonia	7
Atelectasis of lung	2
Paralyses	2
Acute glomerulonephritis	2
Edema of lung	1
Edema of larynx	1
Cerebral damage from asphyxia	1
TOTAL	23

in two cases: one thirteen years before and the other five years. One of these had received antitoxin. Five patients had been actively immunized, one to three years prior to contraction of the disease.

Antitoxin was administered in all but two instances. Of twenty-eight patients with laryngeal involvement,

TABLE III. YEARLY INCIDENCE AND MORTALITY RATE OF DIPHTHERIA AT MINNEAPOLIS GENERAL HOSPITAL 1934 TO 1941

Year	Number of Cases	Deaths	Mortality Rate (Per Cent)
1934	59	4	6.7
1935	22	3	13.6
1936	45	7	15.5
1937	5	0	0
1938	8	2	25
1939	8	1	12.5
1940	14	3	21.4
TOTAL	161	20	12.4

fourteen required interference to combat asphyxia. This consisted of intubation in five, tracheotomy in eight, and bronchoscopic aspiration in one. Of these, there were seven deaths, six occurring in children under ten years of age.

Complications were encountered in 9 per cent. Myocarditis and pneumonia were by far the most frequent. Edema of the lung, of the larynx, and cerebral damage from asphyxia were the least commonly observed. Paralyses, acute glomerulonephritis, and atelectasis of the lung comprised the intermediate group. These complications are tabulated in order of frequency, Table II.

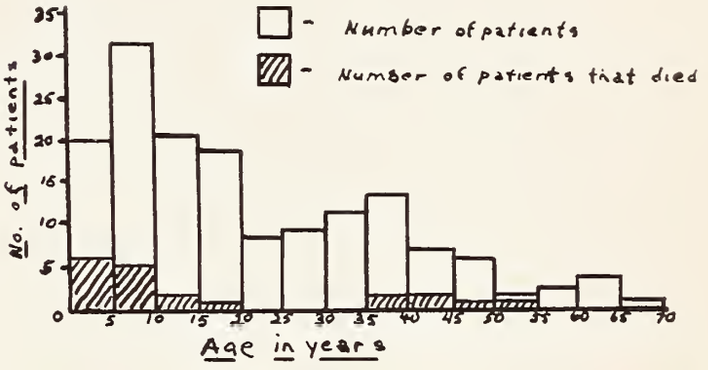


Chart 1. Age incidence and fatality of 161 cases of diphtheria.

The yearly mortality rate varied from zero to twenty-five per cent. For the entire period, the mortality rate was 12.4 per cent (Table III).

The twenty fatal cases showed laryngeal involvement in fourteen and pharyngeal in five. The remaining case was a diphtheritic balanitis. The greatest number of deaths occurred in the youngest age groups. This is represented by the shaded areas in Chart 1.

Dr. E. T. Bell: I have seen numerous cases of laryngeal diphtheria with negative throat cultures. Cultures were checked by expert laboratories and still came back negative. You simply have to go by the clinical impression and give antitoxin. If you wait for positive cultures, things happen as they have in this case. It is rather surprising to see such a large number of older people with diphtheria. It brings out well the point that diphtheria is by no means exclusively a disease of childhood.

Dr. A. V. Stoesser: I am sure that if you take a careful enough history in most of these cases, and if you go back into their history far enough, you will find that they have had a sore throat for some time. The difference between the cases we see today and those we saw some years back is that they are now not discovered soon enough. Physicians are not looking for diphtheria as they used to. A few years ago, if the doctor saw a patient with a sore throat, a culture was taken, usually by himself. I think that it is a mistake to permit nurses and orderlies to take nose and throat cultures. We must emphasize the importance of taking the cultures in the presence of sore throat whether it be in a child or in an older individual. Another thing that should be mentioned is the dosage of antitoxin to be administered. For some time, we made the mistake of giving too little antitoxin. Now we give adequate amounts. Some physicians believe that antitoxin in large doses is harmful, but I see no evidence of that. Any excess of antitoxin administered is merely excreted in the urine.

Dr. E. T. Bell: What per cent of the children in this community have been immunized to diphtheria?

Dr. A. V. Stoesser: I do not know the exact per centage but we have a very poor record here in comparison to some of the other large cities. There is no doubt but that when Schick tests are negative, that community is rid of diphtheria.

CAROTIDO-CAVERNOUS FISTULA*

KARL C. WOLD, M.D., and ROBERT W. HOLMEN, M.D.
Saint Paul, Minnesota

TRAUMATIC rupture of the internal carotid artery in its passage through the cavernous sinus is the most frequent anatomical cause of pulsating exophthalmos, according to Meyer and Sugar who have reviewed the entire literature to 1939 and found 786 cases of this rare condition. The next most frequent cause is a spontaneous fistula between these vessels, usually due to a generalized arteriosclerosis and less commonly to vascular syphilis, and found in an older age group. Other causes are vascular tumors of the orbit or surrounding tissues, simple aneurysms of the ophthalmic artery, arteriovenous fistula involving the internal carotid artery and the internal jugular vein at the entrance of the carotid canal, arteriovenous communications within the orbit, and absence of a large part of the orbital roof.[1]

The typical picture of pulsating exophthalmos due to carotido-cavernous fistula follows a head injury severe enough to cause a period of unconsciousness. Soon after recovering consciousness the patient becomes aware of a rushing noise in his head which is more marked when he is lying down or is in a stooped position. Double vision caused by paresis of one or more of the ocular muscles, usually including the lateral rectus, makes its appearance. Vision fails, and the eyeball bulges from its socket. Pulsation of the orbital contents may or may not be obvious. Edema of the conjunctiva is common. A swishing bruit, synchronous with the pulse beat, may be heard through the stethescope when placed over the orbit or temporal region and may be caused to disappear or to be modified by digital compression of the common carotid artery. Examination of the eye grounds reveals evidence of engorgement.

Treatment is necessary for visual, subjective, and cosmetic reasons. According to de Schweinitz 20 per cent of all cases terminate in blindness and no more than 11 per cent retain normal vision. Rest may result in clot formation and a spontaneous cure. Surgical treatment includes ligation of the internal or common carotid artery. Whether to ligate the internal carotid or the common carotid is apparently a moot question. But either ligation should be preceded by gradually increasing periods of digital compression of the common carotid artery until the patient is able to tolerate such compression for at least thirty minutes.[2]

The collateral circulation, after ligation of the common carotid, is carried on by the anastomosis of the internal carotid with its fellow of the opposite side through the circle of Willis, by the vertebral with the opposite vertebral, by the inferior thyroid with the superior thyroid, by the deep cervical branch of the costocervical trunk with the descending branch of the occipital, by the superior thyroid, lingual, facial, occipital, and temporal arteries with their mates of the opposite side, and by the ophthalmic with the angular. The anastomosis between the deep cervical branch of the costocervical trunk with the descending branch of the occipital is an important one.[3]

Following its passage through the carotid canal in the petrous part of the temporal bone, the internal carotid artery passes through the entire length of the cavernous sinus which lies along the side of the sphenoid bone. This venous sinus occupies the interval between the endosteal and meningeal layers of the dura mater. In the posterior part of this interval lies the Gasserian ganglion. This venous space extends from the medial end of the sphenoidal fissure in front to the apex of the petrous bone behind. Its lateral wall contains the oculomotor and trochlear nerves and the ophthalmic division of the trigeminus, lying in this relation from above downward. In close contact with the internal carotid artery in its passage through the sinus lies the abducens nerve. These two structures are separated from the venous blood only by the endothelial lining of the sinus.[4]

The cavernous sinus is broken up into many endothelial-lined, intercommunicating compartments by numerous trabeculae. Anteriorly it receives the ophthalmic vein, with which it is practically continuous, and the sphenoparietal sinus. Communication with its fellow on the other side is effected through the small anterior and posterior intercavernous sinuses which cross the midline before and behind the hypophysis. Posteriorly it ends in the superior and inferior petrosal sinuses. The sphenoid bone inferio-medially provides the sinus with its only bony relationship.[4]

When a communication develops between the artery and the sinus there is a disruption of the local arterial and venous blood pressures. The ophthalmic vein, in addition to its normal venous load, is forced to receive arterial blood under high pressure from the internal carotid artery. The intersinus communications being unable to cope with the increased volume of blood, the sinus and the ophthalmic vein with its tributaries become dilated. As a result of this dilatation and the engorgement of the soft tissues of the orbit, there develops an exophthalmos and a pulsating swelling behind the medial angular process of the frontal bone. The passage of arterial blood through the abnormal channel may be heard as a rushing bruit when the stethescope is placed over the orbit or temporal region. The loss of vision and the ophthalmoplegia may be explained by injury to the optic, oculomotor, trochlear, and abducens nerves. This injury may be effected by the original trauma, by the dilatation of the sinus in whose lateral wall most of these nerves lie, by impaired nutrition, by pressure, or by the stretching induced by the proptosed eyeball.

The following describes a case of arteriovenous fistula involving the internal carotid artery and the cavernous sinus.

*Read in abstract before the Minnesota Academy of Ophthalmology and Otolaryngology, December 13, 1940.

The patient is a young married man, thirty years old, and in good general physical condition. He was first seen on May 9, 1940, five days after being struck by a fist over the left temporal region, a blow which stunned him momentarily but which did not cause unconsciousness. His first complaint was double vision, appearing almost immediately following the injury and progressing daily.

At the time of his first visit his complaints were double vision, pain through the left eye radiating to the back of the head, and intermittent slight nosebleeds from the left nostril. Examination revealed a normal appearing left eye with no congestion, proptosis, or hypertension. Vision was 6/6-3 and the eyegrounds were normal. The Maddox rod test showed an esophoria of nine degrees. The nasal bleeding was found to be caused by an ulceration in Kisselbach's area of the septum. A temporary diagnosis of paresis of the left external rectus muscle following a cerebral concussion was made. The septum was cauterized and the left eye was covered with a pad.

On May 14, five days later, the patient was seen again. He complained of increased pain in and about the left eye and described a swishing noise in the region of the left ear when in a recumbent position. A moderate proptosis had developed and a slight nystagmus was noted. Vision had dropped to 6/7-3 but the eyegrounds were still normal. No bruit was discernible with the stethescope. The patient was asked to return in three days, but he was not seen until a month later. During this interval he had been taking chiropractic treatments. By this time the picture had changed considerably. Proptosis of the eyeball was now very pronounced, although the eye could be pressed in to present an almost normal appearance. It would recede spontaneously at times, according to the patient. The eyeball was completely immobile due to a complete paralysis of all of the extrinsic ocular muscles, including the levator. Vision was found to be less than 6/120 but the eyegrounds were still normal. The swishing noise heard by the patient had increased and was more pronounced when the eye was bulging and when he was lying down. On this occasion a loud rushing bruit synchronous with the heart beat could be heard with the stethescope placed over the eyeball and over the left temporal region. The bruit could be made to disappear by pressure over the left common carotid artery. The blood Wassermann was found to be negative. A diagnosis was then made of an arteriovenous fistula involving the internal carotid artery and the cavernous sinue. An x-ray examination disclosed no evidence of skull fracture but did show an abnormality in the formation of the left optic foramen and of the left sphenoid fissure, these changes possibly being due to erosion by an impinging aneurysm or tumor.

At the suggestion of Dr. William Peyton of the University surgical staff daily digital compression of the common carotid artery was begun. This was done to stimulate the establishment of collateral circulation as preparation for carotid ligation. Whereas the patient could tolerate the procedure but a few minutes at first, he could stand thirty-five minutes of compression at the end of three weeks. During this period the proptosis increased and the entire left side of his face became swollen. The bruit became more pronounced and all subjective symptoms increased in severity.

On July 2, two months after the accident, a ligation of the left internal carotid artery was done under intratracheal anesthesia. This resulted in a slight lessening of the symptoms and an alteration in the quality of the bruit but did not cause it to disappear. Nor was the proptosis affected. However, the conjunctiva became severely edematous. Ten days later the neck was again entered and the common carotid ligated. Immediately the bruit ceased and the head noises and headache disappeared. Six days later the patient was able to leave the hospital. At this time his vision enabled him to count fingers at five feet. The eyeball had returned to its normal position in the orbit but was immobile. The upper lid was flaccid.

Vision rapidly returned. Within four weeks after operation the patient read 6/21+2. In another month his vision had improved to 6/12—2 and in one more month to 6/9—1 where it has remained. The return of muscle action has been extremely slow. No ocular motion was discernible until seven weeks following operation. At this time slight motion down and out was observed. At the ten-week stage motion up was noticed, and at the end of thirteen weeks some motion in all directions and the first noticeable lid movement was present. Since this time improvement in motion of the eye and lid has progressed slowly and continues to improve so. At the present date, twenty-six weeks following ligation, motion of the eyeball is estimated roughly at 25 per cent and motion of the lid at 75 per cent of normal.

With the advent of cold weather and probably due to incomplete closure of the lids the patient developed a large corneal ulcer which was extremely difficult to bring under control.

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LEIOMYOMA OF THE UTERUS COMPLICATING PREGNANCY

W. L. PALMER, M.D., F.A.C.S., and HARRY B. NEEL, M.D.
Albert Lea, Minnesota

LEIOMYOMATA uteri, or uterine fibroids, are the most common abdominal tumor encountered by the general surgeon. A knowledge of their pathology and an understanding of the proper methods of diagnosing and treating them constitute a large portion of the armamentarium of the gynecologic surgeon.

The association of uterine fibroids with sterility has long been observed but it has not been established that fibroids cause infertility. In fact, fibroids constitute one of the most common complications of pregnancy. In pregnancy some of the fibroids move upward with the growing uterus and assume a position in the abdomen while others, such as cervical fibroids, remain in the pelvis. As the pregnant uterus enlarges and its wall becomes thin, tumors which were not detectable before pregnancy become prominent and are easily palpable through the abdominal wall. Not only are the fibroids made more conspicuous by their altered position, but they actually engage in the succulence and hypertrophy characteristic of pregnancy. It is said that they are

stimulated by the rich blood supply of the pregnant uterus.

The type of complication caused by a fibroid during pregnancy depends upon several factors. A tumor high in the uterus is more likely to produce abortion or premature labor than a cervical fibroid, while the latter may obstruct descent and delivery of the child. Submucous fibroids have a greater tendency to produce abortion than interstitial and subserous fibroids. Pedunculated fibroids may become twisted on their pedicles and cause excruciating pain. Such an accident may lead to gangrene of the tumor and abortion. Rupture of the uterine wall is one of the most serious catastrophies to which uterine fibroids are said to predispose.

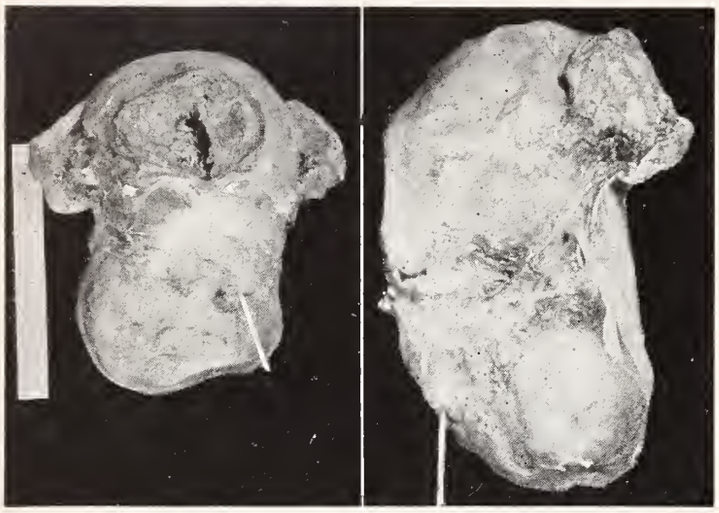


Fig. 1. (*left*) Anterior-posterior view of the surgical specimen. The upper half comprises the puerperal uterus with the incision through which the child was extracted. The lower half of the specimen is the cervical fibroid. A probe protrudes from the cervical canal. The molding of the tumor is obvious.

Fig. 2. (*right*) Lateral view of the uterus and fibroid. It is readily seen that the fibroid is nearly as large as the contracted uterus and that its shape conforms to the configuration of the pelvis.

The management of uterine fibroids usually presents no great difficulty but in exceptional cases the judgment and skill of the surgeon are taxed. Especially in pregnancy is it difficult to determine the safest procedure, the one that offers the best chance of survival to both mother and child. There are some who advocate myomectomy early in pregnancy. It is hardly justifiable to make this procedure a routine because many pregnancies are not disturbed by the small fibroids in the uterine wall, and the operative procedure may produce abortion. If the fibroid is large and it seems reasonable that pregnancy might be interfered with by its presence, surgical removal of the tumor is indicated. The patient should be informed that surgical intervention, although indicated, is occasionally followed by premature labor.

Even in those cases in which delivery is effected successfully in the presence of a fibroid the possibility of a complication has not been avoided. During the puerperium, fibroids will delay involution of the uterus and may obstruct the lochial flow. DeLee has said that they predispose to thrombophlebitis and infection. The sudden diminution of the blood supply to a fibroid after parturition may lead to degeneration of the tumor. Titus stated that this is the complication most frequently encountered.

In many instances it is advisable to postpone operative intervention until term, or near term, when the prospects of a viable child are good. Cesarean section can then be performed and the fibroid dealt with in the best possible manner. If the patient is elderly and has other children, hysteromyomectomy is the procedure of choice. If the patient is young and desires more children every effort should be made to save the uterus.

A patient recently referred by Dr. L. Hanson, of Frost, Minn., presented some of the difficulties encountered in pregnancy complicated by a large fibroid.

The patient was a secundi-gravida, thirty-one years of age. The family history and past history were essentially negative. The one child had been delivered normally nine years ago but the patient was said to have had a severe laceration. The date of the last menstrual period was February 8, 1940. The patient did not consult a physician for prenatal care.

Early on September 19, 1940, the patient *fell* into labor and the membranes ruptured soon thereafter. She consulted her physician and was examined. The fundus of the uterus was just below the xiphoid. The fetal parts were palpable on the right side and the fetal heart was audible in the left lower quadrant of the mother's abdomen. There was a ballotable mass just above the symphysis pubis but on rectal examination there was found a large mass which filled the pelvis and seemed to be the fetal head. The cervix was not identified. Although the uterine contractions were strong and frequent, there was no change in the findings after several hours. The patient was admitted to the Næve Hospital. She was again examined and the impression was that a large pelvic tumor obstructed the descent of the child. Cesarean section was decided upon.

Under nitrous oxide, oxygen and ether anesthesia a low mid-line incision was made. The uterus was symmetrically enlarged and the entire pelvis was filled with a large tumor, the consistency of which was similar to that of a fetal head. It arose from the posterior aspect of the cervix. An incision was made into the uterus and a live male baby which weighed three pounds, ten ounces, was delivered at 7:25 p. m. The position and size of the tumor made it impossible to do a myomectomy and preserve the uterus, so removal of the tumor and subtotal hysterectomy were indicated and performed. The fibroid had been so well molded into the pelvis that it was difficult to extract it and when it was finally removed there was a noise like that produced when a cork is quickly withdrawn from a bottle. The pelvis was peritonealized and the abdomen closed in the usual manner. The patient left the operating room in good condition.

The fixed specimen measures 19.5x13x12 cm. The contracted uterus and the tumor are approximately the same size as is demonstrated in Figures 1 and 2. Microscopic sections of the tumor reveal the typical picture of leiomyoma.

The patient made an uneventful convalescence and the infant gained weight rapidly.

NOTE: We wish to express our indebtedness to Dr. E. S. Palmerton for the illustrations accompanying this article.

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HISTORY OF MEDICINE IN BROWN COUNTY

Compiled by George B. Weiser, M.D.

(Continued from May issue.)

Later Physicians in New Ulm

Dr. Theodore F. Hammermeister was born in Eden township, Brown County, near Morgan, Minnesota, July 25, 1887. He graduated from the University of Minnesota, Bachelor of Science, 1913; Doctor of Medicine, 1915, and served his internship at Northwestern Hospital, and Elliott Hospital, University of Minnesota.

Dr. Hammermeister located in New Ulm June 15, 1915, and has been in continuous practice there to date (1940). During his first four years he was associated with Dr. O. C. Strickler. He has been health officer of New Ulm since 1937; president of the local Board of Education for the past seven years. He is a member of the Redwood-Brown County Society, the Southern Minnesota Medical Association and the American Medical Association. He took postgraduate work at New York Polyclinic Medical School, the New York Postgraduate School, and in the Laboratory of Surgical Technique, Chicago, Illinois.

Dr. A. L. Kusske was born in Sibley County, June 24, 1894. He graduated from the University Medical School in 1907, and was located at Hutchinson, Minnesota, from 1911 to 1916. He took a postgraduate course at Illinois Eye and Ear Infirmary and then located in Minneapolis, 1918 to 1924. He was assistant in the Eye Department of University of Minnesota Medical School from 1918 to 1924.

He moved to New Ulm in 1924 and has practiced there continuously to present time (1940). He confines his practice to his specialty, eye and ear diseases.

Dr. F. J. Pelant was born in Montgomery, Minnesota, July 31, 1886. He received his preliminary education at St. Thomas College and Saint Paul Seminary and graduated in medicine at the College of Medicine and Surgery, Chicago, in 1916. He served his internship at St. John's Hospital, Springfield, Illinois, and did postgraduate work at the New York Polyclinic in 1916. After graduation he practiced for a brief period in Iowa before coming to New Ulm.

Dr. Frederick H. Dubbe was born at Jordan, Minnesota, April 27, 1895. He attended high school at Jordan and Carleton College, 1912-1913, before attending the University of Minnesota, where he received the B.S. degree in 1915. He graduated from the University of Minnesota Medical School in 1919 and served his internship at the Minneapolis General Hospital, 1919-1920.

On June 1, 1920, Dr. Dubbe located in New Ulm where he has been in continuous practice to the present time (1940). He is a member of the Redwood-

Brown County Society, the Southern Minnesota and State Medical Associations and the American Medical Association, and a fellow of the American College of Surgeons. He is local surgeon for the Chicago & Northwestern and Minneapolis & St. Louis Railroads and a member of the American Railway Medical Society.

Dr. Clifford T. Ekelund was born in Saint Paul, Minnesota, December 7, 1893. He received his B.S. and M.D. degrees at the University of Minnesota Medical School. During the World War he served in a base hospital in France until March, 1919, followed by an interlude of eighteen months with the American Expedition to Poland, organizing, doing surgery, etc.

Returning from the war he became a teaching fellow in the Graduate School of Medicine at the University of Minnesota and was chief resident in medicine at the Minneapolis General Hospital. The following year he became chief resident in surgery at the University Hospital for two years. From January 1, 1923, to July 1, 1923, he was associated with Dr. T. F. Hammermeister at New Ulm. In July, 1923, he became a member on the staff of Rood Hospital, Hibbing, Minnesota, remaining there three years; then moved to Pontiac, Michigan, where he has been continuously engaged in the practice of medicine and surgery. He was elected for the term of one year as secretary of the Michigan State Medical Society.

Dr. Albert Fritsche was born in New Ulm January 31, 1893. He graduated from the New Ulm high school in 1911, attended the University of Wisconsin as a pre-medical student, 1911-1913, attended the University of Wisconsin Medical School, 1914-1917, and graduated from the Chicago College of Medicine and Surgery, Loyola Seminary, in 1918. He served his internship in the Norwegian-American Hospital, also Asbury Hospital, Minneapolis.

He became associated with his father, Dr. L. A. Fritsche, in the Fritsche Clinic, in 1919 and has continued there to the present time (1940), specializing in surgery. He was a member of the Medical Reserve Corps in active duty, 1917-1918; vice president of the Minnesota State Medical Association, 1940; and is a past president of the Southern Minnesota Medical Association. He is a Director of the Citizens State Bank of New Ulm and the New Ulm Roller Mill Company.

Dr. William Henry Fritsche, son of Dr. L. A. Fritsche, was born March 20, 1895. He graduated from the New Ulm high school, 1913; attended the University of Minnesota, 1915-1916; graduated from Marquette Medical School, 1919; served his internship in the New York Lying-in Hospital. Beginning October, 1919, he was associated with the Fritsche Clinic until his death in 1923.

Dr. F. D. Hurd, a graduate of University of Minnesota Medical School, first located at Hibbing, then came to New Ulm in 1926. He was associated with the Fritsche Clinic for six months, then moved to Great Falls, Montana.

Dr. Carl John Fritsche was born at New Ulm January 14, 1904. He graduated from the New Ulm high school, attended the University of Wisconsin, 1922-1924; University of Minnesota, 1924-1926; Northwestern University Medical School, Chicago, 1929, and served his internships at the Norwegian-American Hospital, Chicago, 1930, and the McCormack Institute of Infectious Diseases,

1929. He located in New Ulm in January, 1930, and has been associated to present date (1940) with the Fritsche Clinic. He was commissioned First Lieutenant in the Medical Reserve Corps in 1932.

Dr. Theodore R. Fritsche was born in New Ulm October 23, 1906. He attended the New Ulm high school and graduated from the University of Minnesota, B.S. degree, 1928. He graduated from the University of Minnesota Medical School in 1931 and served his internship at Letterman General Hospital, U. S. Army, San Francisco, 1930-1931. He had a Fellowship in the Illinois Charitable Eye and Ear Infirmary, 1931-1933, and the Ancker Hospital, Saint Paul, 1933-1934.

Dr. Fritsche located in New Ulm in October, 1935, being associated with the Fritsche Clinic. He received degrees from the American Board of Ophthalmology, 1937, and the American Board of Otolaryngology, 1938, and is a fellow of the Academy of Ophthalmology and American College of Surgeons, of which he was second vice president in 1940.

Dr. Cornelius A. Saffert, born January 12, 1903, received his high school education in New Ulm and at St. Thomas Military Academy, Saint Paul. He entered the University of Minnesota in 1921 and received his B.S. degree in 1923; medical degree in 1926. He served his internship at the Minneapolis General Hospital from 1924 to 1926.

Dr. Saffert located at New Ulm August 1, 1926, and has been associated with Dr. T. F. Hammermeister there to present time (1940). He was health officer for New Ulm from 1934 to 1937.

Dr. L. A. Weissgeber, a graduate of the University Medical School, Toronto, Canada, was associated with the Vogel and Seifert Clinic during the year 1928. He then moved to Northwest Canada.

Dr. Fred H. Wiechman, a graduate of the University of Minnesota Medical School, 1930, located in New Ulm in 1930, then the latter part of that year moved to Sleepy Eye where he engaged in the practice of medicine until 1935; thence to Fort Meade, South Dakota. Dr. Wiechman located in New Prague, Minnesota, in 1939.

Dr. Howard A. Vogel, a native of New Ulm, born February 2, 1907, graduated from the University of Minnesota in 1930. He took his premedical course at the University, then served on a rotating service at Detroit Hospital for eighteen months. He served an internship at Abbott Hospital for two years while attending the University of Minnesota; had a fellowship in medicine at the University of Minnesota for two years, and attended medical clinics in Europe. He located in New Ulm July, 1932, and has continued to practice there since that time.

Dr. O. B. Fesenmaier, born in New Ulm, September 23, 1907, was educated in New Ulm high school. He graduated from the Marquette Medical School in 1936, and served his internship at St. Ann's Hospital. He located in New Ulm the year of his graduation. He is the present secretary of the Redwood-Brown Medical Society.

Correction.—The name of the physician appearing at the end of page 257 of the April issue should be Dr. W. G. Nuessle, instead of Muessle, as printed.

HOMEOPATHIC AND ECLECTIC MEDICINE IN MINNESOTA*

By James Eckman†

Rochester, Minnesota

HOMŒOPATHIC PHYSICIAN.—*A Homœopathic Physician is one who adds to his knowledge of Medicine a special knowledge of Homœopathic Therapeutics and observes the Law of Similia.* All that pertains to the great field of medical learning is his, by tradition, by inheritance, by right. EUGENE H. PORTER, M.D.—Transactions of the American Institute of Homœopathy, 1889, pp. 57, 102.

DURING the passage of some seventy years since Minnesota emerged from what might be called a frontier status, the contributions of homeopathy and homeopathic practitioners of medicine to the state have been largely forgotten. Yet homeopathy and its apostles played an important part in the history of Minnesota, not because the system of medicine itself was important, but because in many pioneer communities in the early years of the state the only physicians available were homeopaths. Moreover, a most provocative parallel could be formed if the gradual development and ascent of homeopathy in the United States were compared to the slow transition of the Territory of Minnesota from a status of virtual isolation to its emergence as a powerful and very nearly self-sufficient unit of the Federal Union. In chronologic aspects, the rise of homeopathy in the United States would be strikingly similar to the evolution of Minnesota as a state.

To the body of homeopathic practitioners of medicine who helped to found medical practice in Minnesota should be added the lesser body of eclectic physicians, many of whom were graduates of medical colleges, others of whom were merely herbalists of purely local renown, "steam doctors," physio-medical healers, naturopathic physicians and mechano-medical practitioners. Men such as these, who ventured into frontier homes and ministered to pioneer settlements from one end of the state to the other, were as necessary to the stricken prairie multitudes as were the well-trained metropolitan physicians and surgeons to their patients. Homeopathy and eclecticism contributed only a little to the great corpus of medicine as it is practiced today; both systems of practice were already senescent when the Twentieth Century began. Yet the practitioners who, however mistakenly, embraced and practiced homeopathy or eclecticism in the fifties, sixties and seventies in Minnesota were as truly pioneers as the men who came out from New England and the Atlantic Seaboard—from Harvard College, Yale College, the University of Pennsylvania, and other famous schools of medicine of the time—to settle in the somber and wildly beautiful reaches of a state in which the fearsome savage still roamed the bleak tundras and the deer and brown bear did not yet fear to show themselves near the outskirts of the frontier hamlets of forest and plain.

No consideration of either the virtues or the faults of homeopathy will be made in this paper; first, because the author is not qualified to do so; second, because such a consideration would have but very little validity if it were intruded into a study such as the present one. For the sake of historical per-

*This study includes ancillary, and not essential, data in extended form which have been collated for a work in progress that is to be submitted to the Graduate School of the University of Minnesota, under the guidance of Richard E. Scammon, Ph.D., LL.D. This study does not represent either the final form or the final content of the aforementioned work.

†Division of Publications, Mayo Clinic.

spective, part of a paragraph by Fishbein[1] may be offered without affirmation or rejection of its conclusion:

> . . . . the influence of Hahnemann was, on the whole, certainly for the good. He emphasized the individualization of the patient in the handling of disease, he stopped the progress of half a dozen or more peculiar systems of treatment based on a false pathology, and he demonstrated the value of testing the actual virtues of drugs by trial. It is probably true that any criticisms which might be brought against him in the light of later and better knowledge apply equally well against a large part of the other medicine of his time.

More recently (1940), Guttentag[2] has suggested that homeopathy actually is "an integral part of the divisions of clinical medicine on the one hand and of pharmacology on the other." Guttentag also professed to have encountered instances of the increasing acceptance of homeopathic doctrines in contemporary medical practice.

The Minnesota State Homœopathic Institute

Organization of the Minnesota State Homœopathic Institute* in 1867 would appear to antedate formation of the Minnesota State Medical Society,† the *Transactions* of which are dated from the year 1870. But Armstrong[3] has shown that the Minnesota State Medical Society actually had been organized on July 23, 1853, and that it was *reorganized* on February 1, 1869, in Saint Paul. Dr. John H. Murphy (1826-1894) is known to have attended the seventh session of the American Medical Association at Saint Louis in May, 1854, as a delegate from the "Minnesota Medical Society,"[4] a circumstance which attests to the existence of an early "regular" medical society in Minnesota antedating the one which was said to have been "organized" in 1869.

The American Institute of Homœopathy is, however, older than the American Medical Association. It was founded in New York City in 1844,[5] whereas the American Medical Association was not founded until 1847.

An unidentified homeopathic physician[6] (probably Dr. William E. Leonard) has written of the Minnesota homeopathic organization:

> Accordingly, at the "Globe Hotel," on the corner of Minnesota and Second streets in Saint Paul, these brethren of a persecuted faith met Feb. 14, 1867. This place was historical, for here had assembled the first legislature; and indeed, all prominent State enterprises in those early days had here their beginnings.

Sixteen homeopathic practitioners drew up the articles of federation for the institute, and these sixteen practitioners in later days came to be recognized by Minnesota homeopaths as the "sixteen apostles." It is not probable that there were many more than sixteen homeopathic physicians in Minnesota in 1867, for it was written that: "In the spring of 1867, the Homœopathists of Minnesota could count their brethren on their fingers."[6]

The sixteen homeopaths who signed the Articles of Association at the old Globe Hotel in Saint Paul were John Nutting Wheat, M.D. (1818-1903), of Minneapolis; E. Cooley, M.D., of Faribault; Charles Draper Williams, M.D. (1812-1882), of Saint Paul; E. A. Boyd, M.D. (1817-1888), of Saint Paul;

*The diphthong *œ*, which in English reproduces the Latin spelling of the Greek combination of *omicron* and *iota*, was employed uniformly by homeopaths in almost all their literature. It has been retained in this study of official titles and in quoted material, but not in the text. It is interesting to note that Hahnemann himself used the expression *homöopathie*, and that the sententious *Edinburgh Review* (volume 50, pages 507 and 513) in 1830 repeated this Germanic form in preference to the English approximation of the Greek compound.

†The name "Minnesota State Medical Association" was not assumed until 1902, when the state medical organization was reorganized in accordance with the recommendations of the American Medical Association.

T. N. Berlin, M.D. (1823-1911), of Farmington; Z. B. Nichols, M.D., of Faribault; T. Romeyn Huntington, M.D. (1829-1873), of Minneapolis; D. S. French (1812-1867), of Shakopee; Heinrich von Wedelstaedt, M.D. (1817-1900), of Saint Paul; William Caine, M.D. (1819-1867), of Stillwater; William Huntington Leonard, M.D. (1825-1907), of Minneapolis; Edward S. Warner M.D.; Philo L. Hatch, M.D. (1823-1904), of Minneapolis; William A. Penniman M.D. (1802-1872), of Minneapolis; Thomas Chatterton Schell, M.D. (1823-1883), of Saint Paul; and Sidney R. Wakefield, M.D. (1822-1916), of Monticello.[6]

Articles of Association for the Institute were filed in the office of the register of deeds of Ramsey County in Saint Paul on February 15, 1867. They were recorded by Jacob Mainzer (1834-1893), register of deeds, in "Book 'A' of incorporations, page 107."[7] On the same date Secretary of State Henry C. Rogers (1834-1871) announced that the Articles of Association for the Institute had been filed in his office "according to law."[7]

Curiously, the Minnesota State Homœopathic Institute was empowered to confer the degree of Doctor of Medicine on any or all of its members. Dr. Heinrich von Wedelstaedt of St. Paul, as will be shown, apparently received such a degree from the institute in 1867. This degree could be awarded to physicians "who may conform to its requirements. Eleven such were granted in the first years of its [the institute's] career, and several applicants for the same rejected. But since then the custom has tacitly fallen into desuetude, although it is still within the legal rights of the Institute. These privileges of a corporation will explain the presence among its honorary members of public men, as well as physicians."[6] The quotation was written in 1882. It would be most interesting to examine one of these old diplomas, if any exist today.

Mechanism for the granting of these diplomas was provided for in the constitution of the institute: members of the Board of Censors were to "examine carefully and impartially each student presenting himself as a candidate for license to practice medicine and surgery, and to report their opinion, in writing, with regard to his qualifications, to the President."[8] If a majority of the Board of Censors decided that the candidate should receive a diploma, he was to pay $5.00 to the institute for it. In section 1 of the by-laws, however, the sum was stipulated to be $25.00, a discrepancy not explained in the *Transactions*.[8] The licensing provision in the clause just quoted referred only to homeopaths; it was an aspect of internal regulation only. There was no state licensing act at this time in Minnesota.

Delegates to the annual sessions of the institute were to be chosen from county homeopathic medical societies and homeopathic medical colleges within the state, neither of which existed in Minnesota in 1867. Annual dues were one dollar.[8]

One year after the institute had been formed, two rather well-known American homeopaths were elected to honorary membership in the Minnesota body. One was Dr. Joseph H. Pulte[9] (1811-1884), a Westphalian by birth who in 1848 had conceived the idea of encircling the earth with a telegraph line, and who in 1852 founded the *American Journal of Homœopathy and Hydropathy*. In 1872 he helped to found the Pulte Medical College of Cincinnati, in which he served as professor of clinical medicine. The other was Dr. Gerhard Saal (? - 1873), one of the founders of the Pulte Medical College and its first professor of clinical medicine and hygiene.[10] One year later (1869) Dr. George Hadfield, a pioneer homeopathic practitioner of Saint Paul who had returned to Cincinnati, was made an honorary member of the institute.

In 1868 the Committee on the Seal of the Institute reported that a seal had been decided upon: "It being the Coat of Arms of the State of Minnesota, surrounded by the words Minnesota State Homœopathic Institute with the date of organization."[11] The writer has never seen this seal, and does not know that it was ever engraved.

A brief chronicle of homeopathy in the United States prior to 1867 was presented by Dr. Henry Hutchinson[12] (1849-1910) of Saint Paul in his presidential address before the Minnesota State Homœopathic Institute in 1884:

> Glancing over the history of our school in the United States, we find that less than sixty years ago the first practitioner of homœopathy settled in New York City. To the late Dr. H. B. Gram belongs this honor.
>
> An American by birth, but of Danish descent, Dr. Gram became a disciple of Hahnemann while practicing medicine in Copenhagen and returned to this country a homœopath in 1825. From this beginning, the advance in the United States was as follows: In 1828 there were two homœopathic physicians; in 1830, six; in 1832, eleven; in 1834, thirty-three, and in 1835, fifty-seven.
>
> In 1866 we find the number increased to three thousand three hundred and fifty, a most wonderful rate of increase. From New York and Philadelphia, westward and northward, has the tide of our increasing numbers swept, keeping pace with the development and peopling of the country.

First president of the Minnesota institute was Dr. William A. Penniman (1802-1872). In his presidential address at the Globe Hotel on June 4, 1867, Penniman struck out at "the errors and mischievous practice of the 'orthodox school,' which has been permitted to control the opinion of the world for centuries," and then proceeded to explain the *credo* of the homeopath:

> The *totality of the symptoms alone representing the disease.* In them he has a guide that may be depended on, and when these are destroyed, he may be certain that the disease is removed; and the true and rational way to do this, is to give a medicine that will produce symptoms similar to the disease. It follows, therefore, that the disease cannot be radically cured, but by a medicine that will produce the entire group of symptoms presented by the disease. . . The great object to be obtained is to have a factitious disease in your mind that resembles the one you wish to cure, selecting *one remedy,* if possible, that covers the entire symptoms of the disease.[13]

Dr. Penniman did not long survive his inaugural address as president of the institute. He died on March 10, 1872, at Elizabeth, Pennsylvania, and in his will he left the sum of $30,000 which was to be used for the construction of the "Penniman Homœopathic Hospital of Minneapolis." The terms of this will were so confusing that legal aid had to be sought at once, after which it was ascertained that before the sum of $30,000 could be obtained from the estate, the homeopathic physicians of Minneapolis and the vicinity would have to raise an additional sum of $70,000 within a period of fourteen years from the date of bequest. Such a subscription was a formidable prospect in Minneapolis of the seventies, but as if it were not enough of a barrier, Penniman's sister, to whom most of his estate had been given, announced that even if the stipulated $70,000 were accumulated, she would not release the $30,000 without a battle in court. Accordingly, in 1876, all hopes of utilizing the Penniman bequest were banished. Dr. Penniman had also declared that the sum of $10,000 with accrued interest was to be taken from his estate and used to endow a chair of homeopathy at the University of Minnesota while his surviving colleagues were collecting the required $70,000, but this was never done, so far as is known. Foundation of the Universiy of Minnesota College of Homœopathic Medicine and Surgery in 1888 was not the result of any provision in Dr. Penniman's will.

An interesting fragment dealing with the history of regulation of medical practice in Minnesota is contained in the historical sketch[6] with which the first volume of the *Transactions* of the institute opens. It would appear that attempts were made by the homeopaths in 1870, 1875 and 1880 to secure passage of an act to regulate medical practice in Minnesota. The attempt of 1880 was centered in an act which was said to have been accepted by both allopathic and homeopathic physicians, and this bill was passed by the Senate. On March 1, 1881, however, the Capitol in Saint Paul burned, and the resultant confusion prevented the bill from being acted on by the House of Representatives.

In 1875, however, a bill was passed which provided that all legally constituted medical colleges or associations within the state could claim for purposes of dissection the bodies of persons buried at public expense, provided that such bodies were not claimed by relatives. *(General Statutes of 1875,* Chapter 124, Sections 36, 7, 8, 9.) It was implied in the historical sketch referred to that homeopaths had helped to pass this bill.[6]

Some of the addresses delivered before the Minnesota State Homœopathic Institute contained much hard-headed practical advice. Dr. A. A. Camp[14] (1854-1888), in his presidential address (which he entitled "The Physician's Heart vs. his Bank Balance") before the institute in 1886 counseled his colleagues:

> Having collected two-thirds instead of one-third of your bills, you will soon have a surplus of spending money. Now Dr. Cathell* recommends that you spend your money in a showy office and handsome livery, a skeleton or two for your office to show your skill in anatomy, a fibroid tumor in glass to show your skill in ovariotomy, and a few dozen tape worms in bottles to show that you can get the bodies, whether the heads remain or not. This may be good advice for Baltimore, but it won't do out here. Invest your surplus money in lands is my advice. Some prefer acres and farms, some prefer city property, some prefer ten per cent notes or mortgages. Any of them are good, if selected with care, and properly bought, and there is variety enough to satisfy all kinds of minds. And it makes all the difference in the world whether you are owing ten per cent or are receiving it.

On the other hand, much unrelenting invective was freely poured forth at annual sessions of the state organization. In 1881, Dr. Charles W. Crary[15] (1835-1905) of Lake City said contemptuously in his presidential address before the institute:

> What would the gold-headed staff so pompously carried by Radcliff [*sic*], Meade [*sic*], Atken [*Askew?*] Baill [*sic*]; and then deposited with the English College of Physicians; say, could it speak for its degenerate successors?

Dr. George H. Hawes[16] (1832-1892) of Hastings was more gentle in his opinion of the "regular" school; in his presidential address before the institute in 1883 he remarked:

> I would not detract anything from the honors our friends of the opposing school have won in the collateral branches of medical science. We would accord them full credit for the reflected light we have absorbed from their researches in all departments, save that of therapeutics. In therapeutics they stand where Hahnemann stood one hundred years ago.

Study of the *Transactions* reveals the rather ironic fact that the "regular" medical journals were thoroughly searched for evidence that so-called allopathic

*Daniel Webster Cathell, M.D. (1839-1925), once professor of pathology in the College of Physicians and Surgeons of Baltimore, in 1882 wrote a book called *The Physician Himself;* in this book and in subsequent editions of it he attempted to point out how the physician should conduct himself and his professional duties and how he should safeguard his economic status.

physicians were using homeopathic drugs and homeopathic methods of therapeusis. If the search was productive, the validity of homeopathy was said to be established, thereby, in allopathic hands.

Yet the relationship between the Minnesota State Homœopathic Institute and the Minnesota State Medical Society seems to have been amicable. In 1883 Dr. Camp, who was treasurer of the institute, announced that he had sent one copy of his organization's *Transactions* to the Office of the Surgeon-General in Washington and one copy to the Minnesota State Medical Society. He reported that the secretary of the latter body had replied by sending to him a copy of its *Transactions* in exchange.[17]

Dr. Charles N. Hewitt (1836-1910), from 1872 to 1897 secretary of the Minnesota State Board of Health and Vital Statistics, spoke before the thirtieth meeting of the Minnesota State Homœopathic Institute at Minneapolis in 1896, and apparently was received with admiration and respect.[18] There is nothing in Dr. Hewitt's long and distinguished career to suggest that he was impressed by any of the doctrines of homeopathy, but his unfailing courtesy and innate sense of fairness would have forbade his being anything but tolerant of homeopathic physicians.

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(To be continued in the July issue.)

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BUSINESS MANAGER
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THE STATE MEETING

IN spite of humid weather, dotted by showers, the eighty-eighth annual session of the Minnesota State Medical Association had a successful termination. The official registration of physicians was 1651.

The following officers were elected for 1942 by the House of Delegates: President-Elect, Dr. H. Z. Giffin, Rochester; First Vice President, Dr. N. H. Baker, Fergus Falls; Second Vice President, Dr. S. B. Haessly, Faribault; Secretary, Dr. B. B. Souster, Saint Paul (reëlected); Treasurer, Dr. W. H. Condit, Minneapolis (reelected); Speaker of the House, Dr. W. W. Will, Bertha (reëlected); Vice Speaker of the House, Dr. E. A. Meyerding, Saint Paul (reëlected); Councilor First District, Dr. L. A. Buie, Rochester; Councilor Second District, Dr. L. L. Sogge, Windom (reëlected); Councilor Ninth District, Dr. F. J. Elias, Duluth (reëlected).

Dr. S. H. Baxter, Minneapolis, was elected to fill the unexpired term of Dr. C. A. Stewart, Minneapolis, councilor of the Sixth District, resigned because of his departure to take a position with the Louisiana State University.

A.M.A. Delegates.—Dr. Frank J. Savage, Saint Paul; Dr. A. W. Adson, Rochester (to fill Dr. Braasch's unexpired term); Dr. James M. Hayes, Minneapolis.

A.M.A. Alternate Delegates.—Dr. George Earl, Saint Paul; Dr. W. W. Will, Bertha.

The Distinguished Service Medals were presented this year to Dr. C. M. Jackson, Minneapolis, and Dr. L. L. Sogge, Windom, for their outstanding services to the profession of Minnesota. The award of the medal to the late Charles Benjamin Wright of Minneapolis was confirmed by the House of Delegates.

The 1942 meeting will be held in Duluth at a time to be designated by the Council.

THE COMMITTEE ON MEDICAL TESTIMONY

DURING the recent meeting of the Minnesota State Medical Association your Committee on Medical Testimony conducted its first investigation. The complaint was submitted in writing to the Committee. A careful study was made of the entire medical testimony, the hospital record, and the x-ray plates. The Committee obtained valuable assistance from four specialists, qualified in the particular fields of medicine involved in the case under investigation. Your Committee wishes to express its appreciation to these four physicians who so willingly gave of their time, their knowledge, and their experience in order that an honest and unbiased opinion could be reached. The full coöperation of every member of the Minnesota State Medical Association is necessary in order to maintain the highest type of medical testimony in the courts of this state. Medical societies from neighboring communities are greatly interested in the program of this Committee and several inquiries have been received.

—E.M.H.

AMERICAN BOARDS

THE whole subject of specialism in medicine is rather a complex one, and our main purpose in dwelling on the subject at all is to explain the steps that have been taken in the standardization of the specialties.

Until comparatively recently a specialist was one who admitted he knew a lot about a limited phase of practice. If he was mistaken, his confreres soon found it out even if the public proved itself somewhat slower in the discovery.

This was a haphazard way of separating specialists from general practitioners, and yet it seemed to work out fairly well. With the enormous advances in medical science the need for specialism became more essential and the desirability of some method for certification of specialists became more apparent. Who were better suited to certify specialists than the profession itself?

Thus, Boards for establishing minimal standards and educational requirements, and for certifying individuals as specialists, came into being. The American Board of Ophthalmology created in 1916 was the first one to be establishd. In 1924 came the American Board of Otolaryngology and in 1930 the American Board of Obstetrics and Gynecology. Up to the present time thirteen American Boards have been established for certification in as many specialties. The appointment of these Boards has been kept in the hands of the profession. At first there was no reason why any self-designated group could not call themselves an American Board. It was early apparent that it was desirable that a Board have the official approval of the national society in that specialty, and of the section of that specialty in the American Medical Association. In order to coördinate the work of the several boards and to avoid duplication of effort, an Advisory Board for the medical specialties was formed in 1933, consisting of two members from each of the American Boards so far established, and representatives from groups primarily interested in medical education, such as the Association of American Medical Colleges, the American Hospital Association, the Federation of State Medical Boards and the National Board of Medical Examiners. The purpose of this Advisory Board is to endeavor to coördinate the common interests of the various Boards and to establish standards for new Examining Boards. The same year the House of Delegates of the American Medical Association authorized the Council on Medical Education and Hospitals to formulate standards for Boards and to officially recognize new Boards meeting these standards, and receiving the recommendation of the Advisory Board of Medical Specialties.

Thus the mechanism has been set up for the establishment of Boards representing the specialties and receiving the official approval of the Council on Medical Education and Hospitals of the A.M.A.

Certification by one of these Boards means that an individual possesses certain minimal educational and other requirements which entitle him to be called a specialist. The whole undertaking has been subjected to criticism. Boggs* was critical of so much standardization of medical qualifications as applied especially to internal medicine. He felt that examinations and evidence of courses followed cannot determine whether one is an internist or not and that an internists's recognition "rests upon the consensus of opinion of his professional colleagues and trainers." He believes internists should obtain their training in a variety of ways rather than that all should be turned out in the same mold. He sees a danger of too much power in the hands of these Boards over hospitals and medical schools. Already hospitals, and perhaps next medical schools, may be requested to appoint only certified individuals to leading positions in the various departments. He fears, in short, that there is danger that too much power may eventually get into the hands of a bureaucrat incapable of judging or evaluating justly.

These Boards have doubtless increased the quality and number of facilities for graduate training in the United States and have in this way been of additional value. The recent publication of a Directory of Medical Specialists by the Advisory Board of Medical Specialties, containing the names of those certified by the various Boards, is valuable for reference.

The Boards should all be meticulous in carrying out their functions so that certification is limited to those qualified by training and from an ethical viewpoint. It is just as important that eligible candidates be not denied certification because of personal dislike or hasty judgment depending on hearsay.

*Boggs, T. R.: Regimentation in medicine. Trans. Assn. Am. Phys., 52:1, 1937.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

CONTRIBUTE NOW

The scientific advancement of medicine has always outstripped the development of its public relations. That this should be so is no reflection upon the leaders of medicine.

It is well known that skill in public relations does not necessarily guarantee excellence in the product or organization promoted.

Organized medicine has been backward in this matter because physicians conceived of themselves as doctors and humanitarians. They felt that their work could speak for itself.

Obviously such an attitude has proved impractical in a world which runs on a balance of power between propagandists and pressure groups.

The National Committee of Physicians, now almost two years old, has gone a long way forward in the work of doing for medicine what county and state societies and the American Medical Association were not organized to do for themselves.

Never has an organization had such magnificent propaganda material to work with, such a sound and well-tried idea to sell. There is no reason why the accomplishments of medicine in America should not be known and valued at every cross road. There is no reason why its work should be halted now, by government regulation—unless the support of the physicians themselves is lacking for this essential task.

Only a relatively small sum is needed from each individual physician provided all do their part; but that sum is needed now. Otherwise the whole effort will have proved to be "too little and too late."

Contributions should be sent at once to the National Committee of Physicians, Dr. F. J. Savage, chairman of the Minnesota Division, Saint Paul.

NEW STATE PROGRAM

An experiment which may prove to be the historic turning point in the control of human tuberculosis got under way under auspices of the Committee on Tuberculosis in Meeker county last month.

That the undertaking may also strengthen further the public position of organized medicine in Minnesota is shown by the widespread lay interest in the project.

No self-interest can be charged to physicians who are giving both their time and their funds to such forward looking measures for human welfare.

Meeker County Plan

The Meeker county plan calls for the tuberculin testing of every man, woman and child on a county-wide basis. It is this area basis instead of group basis which makes the plan unique and puts it on the road to the same brilliant effectiveness that has attended the area testing of cattle in this country.

Farmers Interested

The interest of Meeker county farmers who engaged in the first bitter fight for area testing of cattle herds is keen and well informed. They remember well the difficulties they encountered as pioneers in the campaign to rid cattle of tuberculosis. They are intensely proud of that campaign and of their part in it and this projected extension of essentials of the plan to the human population seems to them both logical and desirable.

The result is likely to be a general and enthusiastic response on the part of all the people in Meeker county. Tuberculin tests and x-ray examinations of reactors will be given without charge for the period, estimated at two years, of the experiment. Meeker county physicians will give their time and services to the project for

this period and funds for x-rays have been appropriated by the Council of the state association.

One of Several

This Meeker county plan is only one of several public projects now under way under Minnesota State Medical Association sponsorship for improvement of health and the control of disease in Minnesota. It has a dramatic quality, however, which has caught public attention and which will not fail to establish in the minds of many people the fact that physicians are banded together for the public good and that their counsel can be trusted.

Doctors in Court

Reports to be presented to the House of Delegates of the association, which is in session as this issue goes to press, show an expansion of the association's program in many directions. One of these is in the direction of the discipline of members and this, also, has attracted interest and approval in many quarters where criticism was not unknown before. It takes the form of the first organized attempt made by medical men anywhere in the United States to tackle the problem of false medical testimony in the courts. With Council approval, a Committee on Medical Testimony was formed last year which was designed to undertake an impartial study of every case where there is reason to doubt the honesty of a physician in the rôle of expert witness. If the committee finds, after careful investigation, that the physician is, in fact, guilty of deviating deliberately from the truth, the whole matter will be submitted to the State Board of Medical Examiners for whatever disciplinary action the latter body sees fit.

Invitation Issued

A special invitation was issued to judges of the district courts of Minnesota to report such cases for investigation. Physicians or other responsible persons are also free to report to the committee. No attempt will be made, of course, to interfere in cases of honest difference of opinion. In rare cases where so-called experts have differed in matters that admit of no reasonable differences, the resulting public scandal has reflected on the entire medical profession. Such cases are likely to be even rarer by reason of the mere existence of this committee. Response of leading judges of Minnesota to the plan was immediate and cordial.

Community Immunization

Another association project for the year was directed toward coördination and complete coverage over the entire state of community immunization and vaccination programs.

The complete elimination of smallpox and diphtheria obviously awaits only the time which vaccination and immunization can be extended thoroughly to the children of every community. Such an extension, where the work has not already been established, could be done easily by state agencies. For the sake of the people themselves and for the sake of the profession which can ill afford to leave such routine public health measures to an advancing system of government medicine, all such measures should be done under local sponsorship by community physicians.

Budget Outstripped

The appeal to all county and district medical societies to complete and establish this work on a routine basis in their own communities was made last fall by the Council and the Committee on Vaccination and Immunization. A packet of helpful material which included all essential information as to techniques, organization and promotion was sent to all county advisory committees, county officers and county nurses as aids to the work. The result was that new programs were started in no less than 35 counties and the demand for vaccine and toxoid from the State Board of Health for the first time all but outstripped the appropriation in the budget of the State Board of Health.

Hoary Epithet

It is clear that the hoary epithet "medical trust" with all its connotations will never stand up in the court of public opinion so long as the organization of physicians is identified in the public mind with such sound movements to protect the public health and promote the public welfare.

New Exhibit

In that connection it should be noted that an attractive public exhibit with sixteen colored slides which show achievements of medicine in

Minnesota in the last hundred years, is to have its first showing to doctors at the St. Paul meeting. The exhibit will be available for showing at other lay meetings this year.

"COMPLETELY OUT OF PATIENCE"

Physicians in San Francisco are reported to be feeling the crack of the politicians' whip with the result that hundreds of them have resigned in protest from the Municipal Employes' Health Service System. The following account of the action of the physicians appeared in the *San Francisco Examiner* on March 28. The Municipal Health Service was started some years ago and its success, to date, has largely been due to the coöperation in the face of constant difficulties by the medical society and its members. The action of the Board is regarded in San Francisco as advance evidence of what would certainly happen if health insurance were made compulsory and run by politicians.

San Francisco physicians began resigning from the Municipal Employes' Health Service System by hundreds yesterday in protest against the "capricious and arbitrary actions" of the system's board of directors.

Simultaneously, the board heaped new fuel on the firse by failing to approve the January fees to physicians serving the system—the failure resulting from the fact that only three out of eight directors responded to President Cameron King's summons to a special meeting to act on the matter.

The wholesale resignations which poured in throughout yesterday protested specifically the board's failure to keep its promise to effect a new system of fees. They were conditional resignations, but were submitted with the undrestanding that they would become final if the board failed to get the new schedule into action within "a reasonable time."

The County Medical Society had suggested that the physicians employ this means of acquainting the board with their determination to procure action, and the hearty response brought this comment last night from Dr. L. Henry Garland, society secretary:

"This tremendous flood of conditional resignations received within thirty-six hours after the society suggested this form of protest is proof the doctors serving the system are completely out of patience with the board's capricious and arbitrary actions.

"The board's actions themselves are proof of what is to be expected when health insurance is made compulsory and turned over to politicians."

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Former Saint Paul Chiropractor Fined $250.00 for Illegal Practice of Healing.

Re: State of Minnesota vs. Peter J. Stolurow, also known as Dr. Stoll

On May 19, 1941, Peter J. Stolurow, forty-six years of age, entered a plea of guilty in the District Court of Ramsey County to an information charging him with the crime of practicing healing without a basic science certificate and was fined $250.00 by Judge Hugo O. Hanft. Stolurow, who operates an orthopedic shoe store at 16 W. 6th Street, Saint Paul, was arrested on May 8, 1941, following an investigation by the Saint Paul Police Department and the Ramsey County Attorney's office of the circumstances surrounding the abandonment of a six-day-old baby on the doorstep of the Salvation Army's Booth Memorial Hospital. This investigation disclosed that Stolurow had made a physical examination of a young married woman for the purpose of determining the duration of her pregnancy. The mother of the child stated that she went to Stolurow for the purpose of having an abortion performed and that he wanted $350.00 to perform it. This is denied by Stolurow but he admitted making the examination. He also admitted receiving $113.00 from the parents of the child, which he claimed was for the purpose of placing the child in a home for six months, at which time the child was to be returned to the parents. The child was born on May 1, 1941, at Samaritan Hospital and was removed from the Hospital on May 6, at which time it was left on the doorstep of Salvation Army's Booth Memorial Hospital by Stolurow.



On May 19, 1941, Stolurow also entered a plea of guilty in the District Court of Ramsey County to an information charging him with endangering the life and health of a minor, and was sentenced by Judge Hugo O. Hanft to a term of one year in the Saint Paul Workhouse. Stolurow was immediately taken to the Workhouse to commence his sentence. A charge of grand larcency in the second degree against Stolurow in connection with his obtaining the $113.00 was dismissed on motion of the County Attorney, after Stolurow had pleaded guilty to the other two charges.

Stolurow has a record of two previous convictions for criminal offenses, one in 1928 for the crime of abortion, at which time he was sentenced to a term of not to exceed four years in the State Prison at Stillwater. He served that sentence, but in 1935 he again became involved in a similar case and was permitted to plead guilty to a charge of practicing medicine without a license and was given a suspended sentence of one year in the Saint Paul Workhouse. Stolurow was formerly licensed to practice chiropractic and chiropody in the State of Minnesota, but had his chiropratic license revoked in 1929, following his conviction for abortion, and in 1935, his chiropody license was revoked as well as his basic science certificate.

REPORTS and ANNOUNCEMENTS

CENTRAL ZONE CONFERENCE AMERICAN SOCIETY FOR THE HARD OF HEARING

The third biennial Central Zone conference of the American Society for the Hard of Hearing will be held at the Nicollet Hotel in Minneapolis, June 26, 27 and 28.

Of particular interest to medical men and medical social workers is the scientific session to be conducted at 2:30 p.m., June 26. Dr. Horace Newhart, director of the Division of Otolaryngology at the University of Minnesota Medical School and a member of the society's board of directors, is chairman of the scientific session and will preside.

The program for this session follows:

"The Hard of Hearing——A Neglected Problem"
Gaylord W. Anderson, M.D.
Professor of Preventive Medicine and Public Health, University of Minnesota

"The Problems of the Hard of Hearing in Industry"
William E. Grove, M.D.
Professor of Otolaryngology, University of Marquette Medical School, Milwaukee

"The Alleviation of Certain Cases of Chronic Hearing Impairment by Surgical Reconstruction of the Conducting Mechanism" George S. Shambaugh, Jr., M.D.
Associate Clinical Professor of Otolaryngology, Rush Medical School, Chicago

"Diseases of the Upper Air Passages as Causes of Hearing Deficiencies".....Lawrence R. Boise, M.D.
Associate Professor of Otolaryngology, University of Minnesota Medical School

"Problems Associated with Hearing Surveys"
Warren H. Gardner, Ph.D.
Consultant Hearing Vision, Division of Maternal and Child Health, Oregon State Board of Health

Question Box on Hearing Problems.

These papers will be supplemented by discussions to be opened by prominent scientific men.

Another medical man taking part in the program is Dr. Thurman B. Rice, chief of the Bureau of Health and Physical Education of Indiana, who will speak at the opening session, the morning of June 26.

NU SIGMA NU FRATERNITY

The fiftieth anniversary of the founding of the Minnesota chapter of Nu Sigma Nu, medical fraternity, was noted April 26 with a banquet at the Minnesota Club in Saint Paul. Approximately 150 persons attended.

Dr. W. P. Larson, head of the department of bacteriology at the University of Minnesota Medical School, was toastmaster.

Principal speaker was Dr. James Trent Christison of Saint Paul, a charter member of the Minnesota chapter. Other speakers were Dr. Stuart Graves, of Tuscaloosa, Alabama, dean of the University of Alabama School of Medicine and secretary of the national organization of Nu Sigma Nu; Dr. Donald C. Balfour of Rochester, director of the Mayo Foundation and president of the honorary council of the national organization; and Fred W. Gaarde of Rochester, newly elected president of the active chapter.

In addition to Dr. Christison, there are two other charter members of the Minnesota chapter living. They are Dr. E. Sydney Boleyn of Stillwater and Dr. George E. Senkler of Saint Paul. Neither was able to be present at the banquet.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

The Minnesota Academy of Ophthalmology and Otolaryngology conducted a meeting in Rochester, May 9. Following a luncheon at the Mayo Foundation House, a scientific program was conducted at the Mayo Clinic. Papers were presented by Drs. K. M. Simonton, G. B. New, Grace Roth, C. L. Yaeger, H. J. Moersch, and Edith Parkhill.

MINNESOTA SOCIETY OF INTERNAL MEDICINE

The bi-annual meeting of the Minnesota Society of Internal Medicine was held in Minneapolis, May 17, at the Hennepin County Medical Society rooms. Scientific sessions were conducted in the morning and afternoon.

Guest speaker at the banquet in the Minneapolis Club was Dr. W. J. Luyten, professor of astronomy at the University of Minnesota.

Dr. Max Hoffman of Minneapolis is president of the society; Dr. Cecil J. Watson, vice president; and Dr. Reuben A. Johnson, secretary.

HENNEPIN COUNTY MEDICAL SOCIETY

The election of Dr. Edward J. Huenekens of Minneapolis to the presidency of the Hennepin County Medical Society is announced. Dr. Huenekens will take office October 7, and will succeed Dr. R. W. Morse, who will become chairman of the executive committee.

Other officers who will be installed with Dr. Huenekens are: Dr. Willard D. White, first vice president; Dr. Charles E. Proshek, second vice president; Dr. William R. Jones, secretary-treasurer, and Dr. Henry L. Ulrich, librarian.

Named to committees and boards were: Dr. James A. Johnson and Dr. James S. Reynolds, executive committee; Dr. Stephen S. Baxter and Dr. Erling W. Hansen, board of trustees; Dr. Charles R. Drake and Dr. Norman Johnson, board of censors; and Dr. Huenekens and Dr. A. H. McFarland, ethics committee.

SAINT PAUL CLINICAL CLUB

Dr. Edward Churchill of Boston, professor of surgery at Harvard Medical School, addressed a dinner meeting of the Saint Paul Clinical Club, May 24, at the Minnesota Club. His subject was "Experiences with Resection of the Esophagus for Carcinoma."

Dr. John E. Holt, president of the club, presided. Chairman of general arrangements was Dr. Max W. Alberts.

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

The general staff of the Mayo Clinic and members of the Olmsted-Houston-Fillmore-Dodge County Medical Society joined together for a meeting, May 7, in the Mayo Foundation House at Rochester. Dr. A. F. Risser of Stewartville and Dr. F. M. Feldman of Rochester gave reports on lectures on pediatrics recently given at the University of Minnesota and a motion picture, "When Bobby Goes to School" was shown.

In Memoriam

Paul Dee Berrisford

Dr. Paul Dee Berrisford, one of the well known ophthalmologists of Saint Paul, died April 17, 1941, at the age of fifty-six after a four years' illness.

Dr. Berrisford was born December 2, 1884, in Saint Paul, the son of Mary E. and Paul J. Berrisford, Saint Paul pioneers. He attended the public grade schools and Central High School. He graduated from the University of Minnesota Medical School in 1912. After serving his internship at Ancker Hospital in 1912-1913 he went to Vienna in 1913 for postgraduate study and was there at the outbreak of the World War. In September, 1914, he went to London and took a course in ophthalmology at Moorfields Royal London Ophthalmic Hospital, serving at the close of the course as a junior assistant at the hospital for six months. Upon his return to the United States he took further study in nose and throat work at the Postgraduate College of New York City, where he remained eight months. He then returned to Saint Paul, where he practiced his specialty continually until four years ago.

Dr. Berrisford was assistant professor of ophthalmology at the University of Minnesota, he was a member of the Minnesota Academy of Ophthalmology, a fellow of the American College of Surgeons, a member of the Alpha Kappa Kappa medical fraternity, and a member of the Ramsey County Medical Society, the Minnesota State and American Medical Associations. He was also a member of the staffs of Saint Luke's Hospital, Miller Hospital, Children's Hospital and Saint Joseph's Hospital. For twenty-five years he served in the eye department of the Wilder Dispensary.

In 1949, Dr. Berrisford married Geraldine Kilty. She and two children, Geraldine and Paul Dee, Jr., survive, as well as his mother.

Dr. Berrisford had a fine musical education and possesed a fine baritone voice. Music was his hobby and true enjoyment of it his passion. He possessed a keen sense of humor and an indomitable courage which he maintained in spite of a long period of ill health.

Charles Wesley Pettit

Dr. Charles W. Pettit was born in Fillmore, Fillmore County, Minnesota, on October 29, 1878. He graduated from the Preston High School in June, 1895, and taught school from 1895 to 1897 at Cherry Grove, Minnesota. He attended Carleton College and Hamline University, then the University of Minnesota Medical School, graduating in 1903.

He started the practice of medicine in Byron, Minnesota, in June, 1903, and a year later moved to Minneapolis, locating in an office over King's Drug Store at 12th Street and 3rd Avenue South (the present site of the Vocational High School).

In November, 1903, he married Lina Seith, of Northfield, Minnesota.

In 1916, he moved to the Physician's and Surgeon's Building, there being associated with Dr. Louis A. Nippert. He was on the Staffs of Hillcrest and of Old Asbury Hospitals, and later of the New Asbury Hospital.

About 1919, he formed a partnership with the late Dr. E. K. Green; later on, Dr. Leonard K. Buzzelle was made a member of this group.

He was secretary of the Hennepin County Medical Society in 1918, 1919 and 1920.

In 1938 he established offices with his son, Dr. Paul S. Pettit, dentist, at 704 Physician's and Surgeon's Building, and was there in active practice at the time of his death.

He was a member of the Scottish Rite and the Shrine, of the Minneapolis Professional Men's Club, and of the Hennepin Avenue Methodist Church.

On February 9, 1941, while on his return from a vacation in California, he was stricken with coronary thrombosis and passed away at St. Mary's Hospital, Kansas City, Missouri, on February 25, 1941. Burial was at Oaklawn Cemetry, Northfield, Minnesota.

He was a physician of the highest type, devoted to his practice and his family, a capable counselor to his patients.

He is survived by his wife, Lina S. Pettit; two daughters, Mrs. Bernard C. Grangaard (Mary Pettit) of Windom, Minnesota, and Mrs. Peter Van Hoose, Jr. (Ruth Pettit) of Minneapolis; and two sons, Dr. Charles A. Pettit and Dr. Paul S. Pettit, both of Minneapolis; and two grandchildren, Robert Grangaard and Charles Pettit, Jr.

A. H. McFarland, M.D.

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Joint Meeting with Hennepin County Medical Society, Monday, January 6, 1941

War Symposium on the Surgery of Trauma

The annual all-day joint meeting of the Minneapolis Surgical Society and the Hennepin County Medical Society was held on January 6, 1941.

The following program was carried out at the Minneapolis General Hospital under the supervision of Dr. A. A. Zierold:

Injuries to the Cervical Spine—Willard White, M.D.
Cranio-Cerebral Tumors—O. J. Campbell, M.D.
Shock in Trauma—E. J. Welte, M.D.
Crushing Injuries to the Elbow—E. C. Henrikson, M.D.
Sepsis of the Knee Joint—John Pohl, M.D.
Crushing Injuries of the Pelvis—G. D. Eitel, M.D.

In the afternoon a meeting, presided over by Dr. Arthur Bratrud, was held and the following papers were given:

Treatment of War Wounds based on their Bacteriology—T. H. Sweetser, M.D.
Trauma to the Hand—K. E. Fritzell, M.D.
Reconstruction of the Hip—John M. Moe, M.D.
Injuries to the Ear, Nose and Throat—L. R. Boies, M.D.
Emergency Tourniquet Amputation—S. R. Maxeiner, M.D.
Penetrating Wounds of the Chest—T. J. Kinsella, M.D.
Immediate and Early Skingrafting—H. O. McPheeters, M.D.

In the evening at 8:00 P. M., the combined Societies and visiting physicians were addressed by Dr. Fraser B. Gurd on the following subject: "The Treatment of Gunshot Wounds, with Special Reference to Modification of Rutherford Morrison's Bipp Method."

COMMINUTED FRACTURES ABOUT THE ELBOW JOINT

Earl C. Henrikson, M.D.
Minneapolis

A series of comminuted fractures involving the bones about the elbow joint were demonstrated.

The first patient had a fracture of the ulna with a dislocation and fracture of the head of the radius. Through a posterior approach the ulna was plated and the fragments of the head of the radius removed. A fascial strip was placed around the neck of the radius to maintain it in position.

The second patient had a comminuted fracture of the head of the radius with a dislocation of the ulna. The fragments were removed at open operation after reduction of the dislocation. Both these patients have practically full range of motion.

In the third patient the articular surface of the lower end of the humerus had been sheared off parallel to the shaft by a fall on the out-stretched arm. The fracture was reduced through a lateral incision and remained in place without internal fixation.

The fourth patient was a comminuted Y- or T-fracture in which there was perfect reduction through a posterior incision. The operation used was that described by Dr. George W. Van Gorder of the Fracture Service of the Massachusetts General Hospital. The procedure is described in the April, 1940, issue of the *Journal of Bone and Joint Surgery.*

Open reduction means more perfect reduction, internal fixation means better immobilization and hence more rapid healing and earlier active and passive motion. Consequently the patients have less stiffness and disability.

SEPSIS OF THE KNEE JOINT*

John F. Pohl, M.D.
Minneapolis

In civil as well as in military life, injuries and infections of joints offer a constant threat to the well-being, the physical integrity, and even the life of individuals exposed to trauma. The knee joint, by virtue of its position, is especially vulnerable to injury. It was estimated in the World War that the knee joint was involved in 3 per cent of all war wounds. Furthermore, of all joints affected, the knee suffered in 33.3 per cent of the cases.

The World War offered a considerable experience in violence to the human body. Most surgeons dealing with battle casualties were deeply impressed with the tragic results of knee wounds and the concomitant infection usually suffered. From this experience a number of valuable lessons were well learned, which were directly applicable to civilian medicine. The first was that the joint synovia, formerly thought to be highly susceptible to disease, really has remarkably good power of combatting potential infection. For instance, a plain high velocity rifle bullet entering or passing through the knee offered a 90% chance that there would be no serious result to the knee even if the wound received no more than a simple dressing. In fact, of all wounds of the knee, including those grossly shattered and contaminated, regardless of the method of treatment, only about 25% became actually infected.

It is this 25% of the knee wounds which become

*From the Department of Orthopedic Surgery, Minneapolis General Hospital.

infected however, which threaten the integrity and life of the patient and offer the surgeon a grave problem in treatment. At the beginning of the World War it was considered inevitable that infection meant a stiff knee, loss of the limb, or an alternative death of the patient. Treatment consisted of drainage of the knee, plus complete immobilization. Surgeons dealing with this situation freely recognized the inadequacy of therapy from the standpoint of recovery. At this time there came into prominence C. Willems, the Belgian surgeon, who championed the cause of immediate active and uninterrupted motion for all injured joints, clean or infected, beginning immediately after operation. To one who has dealt with the problem of joint sepsis this sounds little less than heroic for the patient. However, many patients submitted to the treatment and, since motion was preserved in the knee and the patient survived, the Willems principles were rapidly being adopted at the close of the War. With some modification, the kinetic idea was applied to civilian therapy by those men who had come through this experience.

Since the World War there have been added no new principles of surgical attack of the infected knee, but we have been presented with the highly important chemotherapeutic drugs. Some men have tried to rely upon these agents for sterilization of the infected and purulent joint, but this would seem to be contrary to good surgical judgment.

The time element is the fulcrum upon which success or failure of the treatment of knee injuries must hinge, plus respect for the established principles of surgery. Given a fresh wound, not more than six hours old, it should be possible to clean up the wound, excise devitalized tissues, remove foreign bodies and contamination, instill sulfanilamide, close the wound and expect healing with preservation of useful function in 90 to 95% of the cases, excepting those joints grossly destroyed.

Because of time or other uncontrollable factors, there are going to be some infected joints. Our approach at the Minneapolis General Hospital has been to give an infected joint adequate drainage by medial and lateral parapatellar incisions immediately upon diagnosis. We then give nature 48 hours in which to thrombose vessels and close the channels of infection leading from the incisions, following which motion is begun. This is at first assisted motion, with the active participation of the patient, but becomes entirely active as soon as the patient can be inspired to make the necessary effort. The extremity is best treated on a Thomas splint, hinged at the knee, and with slight traction to the lower leg, to distract the joint surfaces. This method has given satisfactory healing in the majority of cases. Ultimate function, however, seems to bear a direct relationship with the length of time of drainage from the wounds.

An interesting monograph has recently come out, written by Trueta, a Spanish surgeon, based on an extensive experience with wounds in the Spanish Civil War. These cases were all treated by the application of a closed plaster cast immediately following surgical care. Infected joints were likewise immobilized following incision for drainage, apparently with satisfactory results. The book is being widely read and will no doubt have an influence upon the treatment employed in the present war. The conclusions reached after a further experience should be invaluable in crystallizing the attitude to be adopted toward the infected joint.

TREATMENT OF WAR WOUNDS BASED ON THEIR BACTERIOLOGY

THEODORE H. SWEETSER, M.D.
Minneapolis

This paper is being published in full in the *Military Surgeon*. It is summarized as follows:

Early treatment of war wounds is much simpler and more effective than is treatment later after invasion of tissues by bacteria.

All patients should receive tetanus antitoxin as soon as possible. Those with devitalized muscle should receive the combined antitoxin for Cl. welchii, Vibrion septique and Cl. œdematiens. The antitoxin dosage must be larger for patients coming later for treatment.

Treatment of wounds during the early latent period should consist of debridement, drainage (in practically all cases), immobilization in plaster, and the use of one of the sulfonamide group of drugs in the wound and by mouth; subsequent dressings should be infrequent.

Treatment of patients arriving for treatment after establishment of definite infection require more conservative operative care, adequate drainage, immobilization in plaster with special precautions against tightening, and appropriate treatment of the infection found in the wound. The sulfonamide group of drugs is most effective; other drugs are discussed. Hypertonic packs, especially of sodium sulfate, have a field of usefulness.

Trauma, operative or otherwise, even many months after infliction of a wound, may reactivate a latent streptococcus or tetanus infection. Prophylaxis in such cases should include sulfanilamide and tetanus antitoxin.

Gas gangrene is a danger of the first two weeks, only when wounds contain devitalized tissues, especially muscle. The principal infecting organism is Cl. welchii, often in association with Vibrion septique or Cl. œdematiens. Virulence is increased by association with streptococcus. Conservative surgery and serum therapy offer the best results. Amputation may be necessary if the blood supply of the extremity is destroyed. Sulfanilamide may help. X-ray therapy has given good results according to some reports.

Streptococcus hemolyticus, often a secondary invader, is the cause of most of the deaths due to infection of war wounds. Sulfanilamide is the most effective weapon against it and should be used locally as well as by mouth.

INJURIES TO THE EAR, NOSE and THROAT

LAWRENCE R. BOIES, M.D.
Minneapolis

Several injuries are common and of special interest in the ear, nose and throat.

The ear is involved in:

1. External contusion, abrasion, laceration or loss of substance.
2. Concussion causing loss of hearing with or without rupture of the drum membrane.
3. About one-third of basilar skull fractures.

There is no purpose in discussing injuries of the external ear before a group of general surgeons inasmuch as the treatment of these is essentially no different from that of other soft tissue wounds on the surface of the body except in two respects. The presence of cartilage in the external ear as a supporting framework makes important a special consideration of hematomas to prevent external deformity. Hematomas should be aspirated and a mould of dental stent placed so that a pressure band will prevent a refilling of a hematoma. Also, when there is laceration of the canal, the problem of stenosis due to scar tissue may also arise. The necessity for a mold to keep the canal open should be borne in mind.

Traumatic rupture of the ear drum is a common form of injury in civil life. It is much more common among combatants in actual warfare. A small or medium sized hole in an ear drum will usually heal without any difficulty if the middle ear does not become infected. The patient should avoid nose blowing by occluding the nostrils, and the external canal should be kept occluded with cotton to prevent entrance of any foreign material.

Studies have indicated that greater impairment of hearing may occur in instances of concussion in which the drum has not ruptured. Concussion from gunfire and exposure to the noise of airplane motors are the most common causes of ear damage in modern warfare. In the matter of gunfire the damage is not necessarily proportional to the intensity of the sound. In civil life damage is encountered occasionally in the use of ordinary firearms.

We do not have accurate information as to just what happens to the inner ear structure from concussion inasmuch as opportunity for removal of the temporal bone and its pathological study has only been done in isolated instances. Apparently the damage is one of transmitted shock to the organ of Corti, causing degeneration of nerve endings. The manifestations of this shock are tinnitus and a loss of ability to hear certain high notes.

The accompanying audiogram (Fig. 1) is one of a physician who experienced a ringing in his ears after firing a revolver at a target in a basement. This depression of hearing is characteristic of the loss from the concussion of gunfire.

The frequencies most used in ordinary speech are those of 512, 1024 and 2048. In this particular case, because it is the frequencies above this range which are involved, the patient was not conscious of any particular difficulty in hearing. This individual has now been observed over several years. The tinnitus has disappeared, but there has been no recovery from nor any increase in the impairment.

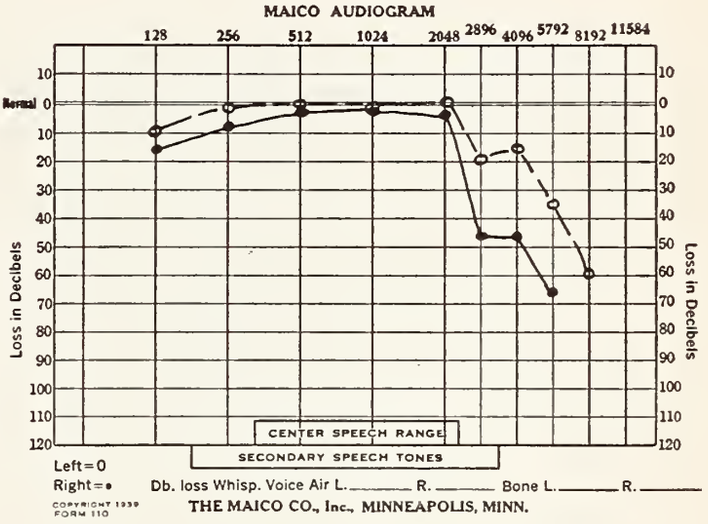


Fig. 1.

It has been estimated that the temporal bone is involved in about one-third of the fractures of the base of the skull. There are two types which extend into the ear. In one, the fracture line extends along the pyramid in the apex to base direction and through the middle ear into the external ear canal. There is blood in the middle ear and external canal from a tear in the drum membrane. However, the inner ear frequently escapes from any permanent damage. In the other form the fracture line extends across the base of the pyramid causing a sudden and permanent destruction of vestibular and cochlear function. There is no bleeding in the external canal because the drum membrane is not torn, but there may be bleeding into the middle ear. When there is bleeding into the middle ear and the fracture is simple, myringotomy is not performed because of the danger of the blood clot becoming infected by way of the opening in the drum membrane. When, however, there is bleeding into the middle ear and the fracture is compound, but without a rupture of the drum membrane, or if there is a rupture but the drainage is unsatisfactory, a myringotomy is performed to prevent, if possible, a potential infection in the blood clot. Otherwise, treatment, insofar as the ear is concerned, consists of taking precaution against the onset of upper respiratory tract infections.

The prognosis as to recovery of ear function, both cochlear and vestibular, depends on certain findings on objective examination. It is not within the purpose of this discussion to consider these tests in detail. When the vestibular and cochlear reactions are obtained on the side of the fracture, the prognosis is good for recovery of freedom from any equilibratory disturbance and of useful hearing. If the vestibular reactions are totally lost, the prognosis is good for recovery of freedom from any equilabratory disturbance, but poor

for useful hearing. The usefulness of positive cochlear reactions in an ear included in a basal fracture is that when hearing is retained, the vestibular function is also preserved, and the prognosis is good for recovery from both the vestibular and cochlear disturbance of functions.



Fig. 2.
(From The Broken Nose, Page 99, Vol. 1, by L. R. Boies in Specialties in Medical Practice. Thomas Nelson & Sons.)

Probably the most common fracture in civil life is the broken nose. It is also the most poorly treated—probably for two reasons. One reason is that the patient does not seek medical attention early due to the absence of any obvious gross deformity aside from that considered to be due to soft tissue swelling. The other reason is that the physician may wait for the swelling to subside before deciding that there is a fracture.

There are essentially three types of nasal fracture. In the simplest type, one nasal bone is depressed medially. Usually both nasal bones are dislocated and the whole bridge is displaced laterally. Often the bridge is flattened as well as displaced laterally. Reduction requires lifting from within with an elevator so as to lift the bridge into position as illustrated.

The broken nose should be reduced promptly unless the treatment of other injuries such as skull fracture makes it inadvisable to submit the patient to even the small amount of manipulation required for the ordinary nasal fracture.

Reduction is a simple procedure in the majority of cases.

The average nasal fracture, if reduced within a few hours after the injury, and often even within a day or two following the injury, will maintain normal position without special splints applied to the exterior or packing within. The reduction can satisfactorily be done in adults under local anesthesia—cocaine to the nasal fossa. Some surgeons also inject the infraorbital nerves.

Associated fracture of the superior maxilla is not uncommonly found along with nasal fracture. Therefore, when there is any suspicion of trauma to the anterior maxilla, palpation of the orbital rim, inspection of the zygomatic contours, and testing the superior alveolus for rigidity is indicated. X-ray studies should supplement this examination.

X-ray studies for determining nasal fracture are not very useful as a factor in determining treatment. The x-rays do not reveal accurately the type and extent of dislocation.

The most important form of trauma to the throat requiring special consideration is that to the larynx. The effect of this, like the effect of trauma elsewhere, may be psychic and anatomic. The psychic form is often confused with malingering. An individual receives a blow across his "Adam's Apple" and apparently cannot phonate afterward.

Examination may reveal possibly a slight interference with motility at first, but normal movement, color, and innervation in the presence of continued aphonia indicate that the patient can phonate once he is convinced that he is capable of doing so.

Anatomic trauma to the larynx is very common in such simple forms as occur from vocal abuse, tobacco smoke, etc.

In treating lacerations or severe contusions of the larynx, the latter occasionally accompanied by fracture, certain facts must be borne in mind:

1. Cartilage repairs poorly. The repair of cartilage is poor anywhere in the body, but it is especially poor in the larynx.

2. In lacerations of the larynx, attempts to close the wound or stitch the divided cartilage is a mistake. The wound should be packed open until danger of virulent infection is over and the fibrous union of the cartilage has been completed.

3. If the internal perichondrium is penetrated, the seriousness of the situation becomes very much greater.

4. A high proportion of cases of trauma to the larynx produce laryngeal edema with resultant dyspnea and the threat of asphyxia. These symptoms may come on quickly—in the final stage precipitately. Consequently, if there is a possible delay in getting the patient to a hospital, someone should stay with the patient prepared to do a tracheotomy. Hesitation to do a tracheotomy in time occasionally loses a life which might have been saved.

I have heard remarks by surgeons to the effect that tracheotomy carries a high mortality. This is not so. In 1937 I reported an experience in 65 consecutive tracheotomies done on our laryngologic service at the University. We had four mortalities in this group and all four could be reasonably attributed to serious disease with which the patient was afflicted rather than the treatment.

Tracheotomies, of course, should always be low. The old terms of "high" and "medium" have been discarded.

Another caution—beware of morphine in the patient with dyspnea or impending asphyxia.

Obviously the examination of the patient suffering from trauma of the larynx should include in addition to the external examination, an indirect and often a direct view. The general surgeon does not take advantage of his frequent opportunities to use a laryngeal mirror as much as he should. Also the opportunity for direct examination is now available inasmuch as most if not all of our city hospitals are equipped with the Flagg Laryngoscopes for inserting the tubes for intratracheal anesthesia or as an air and oxygen way while using the intravenous anesthetics. The obstetricians and pediatricians are also employing the laryngoscope to aspirate the newborn.

THE TEMPORARY TOURNIQUET AMPUTATION

Stanley R. Maxeiner, M.D., F.A.C.S.
Minneapolis

During a recent trip south I saw an article in the San Antonio paper to the effect that an airplane pilot had crashed and sustained such a mutilating injury to both legs that double amputation was necessary. The article further stated that the pilot promptly died following the shock of the accident and the operation.

The experience gained during the first World War, which has been substantiated many times since, taught us to delay operation in selected cases until the patient recovered from the shock or until his general condition improved. The temporary tourniquet amputation makes delay in amputation possible and undoubtedly many patients may be tided through an emergency when immediate surgical amputation would prove fatal.

The procedure consists of very tightly wrapping several loops of gum rubber tubing about the extremity at the lowest possible point at which the member must be sacrificed. In order to control infection and putrefaction in the dead distal extremity the part below the tourniquet is wrapped in 10 per cent formaldehyd dressings encased in rubber sheeting. The initial pain is overcome by the use of hypodermics of morphine or the rectal administration of sedatives such as sodium amytal. Much to our surprise, however, there has been practically no pain after the first few hours, as the tourniquet produces anesthesia.

We claim no originality for this method nor is it new, having been used by Dr. Farr and myself more than twenty years ago. We have employed the method in twelve or more cases to date with extreme satisfaction and no complications such as secondary hemorrhage.

The following case reports demonstrate effectively the type of patients in which the temporary tourniquet amputation is applicable.

Case Reports

Case 1.—A young male adult, while reaching across a circle saw, severed most of the tissues just distal to the axilla. When seen at the end of 48 hours he was in extremely critical condition, his temperature was 102°, his pulse 120 and practically the entire arm below the injury was infected with gas bacillus. The skin was dark, there were no pulsations and no sensation. The general condition of this patient was so critical that in the opinion of those who saw him, he would not stand a surgical amputation.

A tourniquet was placed as high up on the arm as possible and the distal arm wrapped in 10 per cent formaldehyd. Several areas over the shoulder which crepitated were incised and Dakin tubes were introduced. The patient soon began to improve and his temperature and pulse fell to normal within a few days. One week after his entrance to the hospital the condition of the patient was such that he was taken to the operating room and it was found that the tourniquet had cut through all of the soft tissues and it necessary for us to divide only the bone. At a subsequent date a plastic operation covered the denuded surfaces. The patient made an uneventful and rather rapid recovery.

Case 2.—Mr. E. E., aged 50, fell head foremost beneath a train and the wheels severed both arms at the elbow joints. When first seen by us the patient was almost moribund with a blood pressure of 0/0. He was treated with oxygen, transfusion, stimulants etc. and at the end of three and one-half hours his condition permitted a temporary surgical amputation of the right arm. He was given prophylactic tetanus and gas bacillus antitoxin. A tourniquet was wrapped around the left arm at the lowest point of viable tissue. Forty-eight hours later he had a rapid rise in temperature, a chill and gas bacillus infection was found in the left arm above the tourniquet. The patient was again returned to the operating room and the left arm amputated surgically. Dakin tubes were introduced for his gas bacillus infection. Subsequent plastics were necessary on both arms but he made a very satisfactory recovery.

At the time of the accident the patient survived one amputation with difficulty. The tourniquet permitted us to delay operation on the other arm until his general condition permitted. Gas bacillus infection in the left arm certainly would not have occurred if, in our eagerness to conserve all possible tissue, we had not placed our tourniquet too low. During the second operation it was quite obvious that hemorrhage, muscle laceration, etc., had occurred proximal to the site of the tourniquet.

Case 3.—A male adult, aged 78, was struck by a truck, sustaining compound, comminuted fractures of the tibia and fibula and severance of the soft tissues of the calf of the leg, including the vessels, nerves and muscles. There was no sensation and no pulsation below the knee. The patient was taken to the General Hospital in severe shock where he was treated in the emergency room and given 750 cubic centimeters of blood. He was subsequently moved to a private hospital where he entered our care. He was still in shock. His systolic blood pressure ranged from 80 to 90 but his skin was cold and his general condition was poor.

The original tourniquet was removed and an elastic rubber tube tourniquet wrapped about the leg at the level of the knee. The leg below the tourniquet was wrapped in 10 per cent formaldehyde and encased in a rubber sheet. The patient was given an additional 600 cubic centimeters of blood but his general condition was bad. Part of the time he could not be aroused and we felt that amputation at that time was definitely contra-indicated. At the end of twenty-four hours his condition was greatly improved. His blood pressure was 140/70. The next day he was taken to the operating room and under local anesthesia a mid-thigh amputation was performed. He was subsequently given several transfusions and other supportive treatment.

The patient had a rather stormy convalescence but we were fortunate to have primary healing of his flaps. On the sixteenth postoperative day the patient developed bronchopneumonia from which he recovered, and he was discharged from the hospital on the twenty-sixth day with the flaps completely healed.

Case 4.—Mrs. S. H., aged 58, who was referred to us through the courtesy of Dr. W. K. Foster, had been a victim of arthritis and heart disease for a long period of time. On February 27, 1941, when seen by Dr. Foster the patient gave a history of very severe pain in the left leg six days previously and a second attack with violently severe pain in the right leg three days previously.

On examination the popliteal vessels were found to be completely occluded with a beginning gangrene of the left foot and left leg. The right leg had undoubtedly started as a popliteal occlusion but the thrombus had formed until it now occluded the deep femoral vessel and gangrene had already extended well up on to the thigh. The patient was in extremely critical condition with decompensation and auricular fibrillation and at times delirium.

She was treated medically for several days and was presented clinically to the Surgical Section of the American College of Surgeons meeting in Minneapolis as a problem case. We all agreed that inasmuch as the patient was improving and both legs were undergoing a dry gangrene, it was better to let the patient alone. However, a few days later she became progressively more toxic with elevation of temperature and it was quite obvious that the right leg was the cause of her relapse. A piece of gum rubber tubing was wrapped tightly around the thigh at the lowest point at which the amputation might be considered successful. The distal leg was wrapped in formaldehyd dressings covered with rubber sheeting. At the end of nineteen days the patient was very greatly improved. The tourniquet had cut through all of the soft tissues and the bone was severed. The patient's condition improved materially during the time that the tourniquet was cutting through the thigh and since the amputation, her temperature has returned nearly to normal and her pulse and heart action are greatly improved. Surgical amputation on this patient at any time since we have seen her would have been fatal. However, she has stood the tourniquet amputation without any apparent ill effect on her already critical condition. We are now contemplating a tourniquet amputation of the other leg.

In this case, because of the high thigh amputation and the possibility of secondary hemorrhage from the femoral artery, a sterile tray with Kirchner wires and tourniquet was maintained in constant readiness in the patient's room. The Kirschner wires naturally were to keep the tourniquet from slipping off when applied in such a high position.

Part of the twelve cases have been successfully treated by this temporary expedient at the Veterans Hospital.

Conclusion

The temporary tourniquet ampuation has been called to your attention because we believe that it has sufficient merit to tide certain patients over a period in which immediate surgical amputation might prove fatal. We have had no occasion to regret its use. It should not at any time be considered a substitute for surgical amputation except in those instances where the indications exist. Surgical amputation may be employed at the end of one or two days when the patient's general condition is sufficiently improved, or one may quite well wait for a week or more, at which time it will be found that the tourniquet has cut across all of the soft tissues and only the bone need be severed to obtain a guillotine amputation. Naturally, some type of plastic or skin graft will be required to cover the end of such a guillotine amputation stump.

THE EARLY COVERING OF GRANULATING AREAS WITH THE SPLIT SKIN GRAFTS

H. O. McPheeters, M.D.
Minneapolis

Dr. McPheeters gave a general discussion of the subject of skin grafting and briefly reviewed the various methods. He said that the specialists in this work had come to some very definite conclusions as regards it:

1. All efforts must be toward covering the damaged area as quickly as possible. This would tend to prevent the usual scar tissue formation and shorten the loss of time.
2. All necrotic tissue must be removed.
3. The infection must be practically nil before any attempt at grafting was done.
4. A firm vascular granulating bed was preferable to the coarse hydropic type of granulations.
5. The thinner the graft the better the chance of a good take.
6. Firm pressure must be maintained over the graft for 10 days postoperative and as a rule the dressings were not changed for 5 days. The part must be absolutely immobolized.
7. The graft over a granulating bed is best when kept moist with normal saline postoperative.
8. The donor area is best dressed with 4 per cent xeroform ointment in a fine meshed gauze and not looked at for 10 days. As a rule it is healed and dry at that time.

Dr. McPheeters then showed the Padgett Dermatome, a new instrument for removing grafts of any desired thickness, and discussed its use. Several slides were then shown demonstrating the actual technique.

MEDICINALS IN CHINA

War frequently brings about unlooked for changes. One of these is the reversal in attitude by the masses of the rural population in China toward Western medicines. The customary antipathy in this respect has been largely dispelled; Chinese manufacturers of medicinals are looking forward to an expansion of their trade in the future. The opening of transportation routes to the interior resulting partly from the exigencies of war also is playing a part in increasing trade in medicinals in China. The greater part of China's requirements in pharmaceutic, medicinal and biologic preparations are met by imports, the approximate value of which reached $5,775,000 in 1939.* Nevertheless, the domestic industry has expanded and within the past year great progress has been made in the manufacture of biologic preparations, though 70 per cent of the ingredients are still imported. The fact that eight large manufacturing establishments in Shanghai are producing proprietary medicines, vaccines, serums, antiseptics, anesthetics and general hospital supplies gives an idea of the activity in this field.—*Jour A.M.A.*, May 24, 1941.

*News Edition, J. Am. Chem. Soc., 19:261, (March) 1941.

Meeting of February 12, 1941

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 12, 1941. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the President, Dr. John M. Armstrong.

There were forty-one members and 2 guests present.

Minutes of the January meeting were read and approved.

There being no old or new business, the scientific program followed immediately, and consisted of the following case reports.

DISLOCATIONS OF THE ELBOW JOINT

Report of Three Cases

A. W. Ide, M.D.
Saint Paul

Dislocation at the elbow joint is of rather frequent occurrence. In the adult, it is next in frequency to dislocation of the shoulder. This is because of the extreme mobility of the joint. It is capable of movement in a varity of directions. The leverage is great on account of the long bones involved in the joint.

In early life, it is the most frequent joint to be dislocated. During this period, the joint structures are slow in developing. The coronoid and the olecranon, that are so important in stabilizing the joint, are poorly developed in children. The epiphyses are much weaker and are more subject to injury than is the adult bone. The epiphyses may be slightly loosened from their attachments even without x-ray evidence.

The early writers on this subject were very much handicapped in the study of these lesions until the advent of the x-ray. Much of their information came from postmortem specimens. Further, they were apt to consider primarily the dislocation and disregard incidental injuries to bone and soft parts.

The early classifications were very elaborate, for example: dislocations of the forearm were divided into: (a) backward, (b) forward, (c) outward, (d) inward. Each of these subdivisions were divided into four or five subheadings.

In this connection, it is interesting to note the method described by Sir Astley Cooper in the early eighties:

Slide 1. This illustration was taken from Stimson's book on dislocations that was published in 1888. It illustrates the method used in reducing dislocations at the elbow joint at that time. This method of reducing backward dislocations of the elbow was described by Sir Astley Cooper as follows:

"The patient is made to sit down upon a chair, and the surgeon, placing his knee on the inner side of the elbow joint, in the bend of the arm, takes hold of the patient's wrist, and bends the arm. At the same time, he presses on the radius and ulna with his knee, so as to separate them from the os humeri, and thus the coronoid process is thrown from the posterior fossa of the humerus; and whilst this pressure is supported by the knee, the arm is to be forcibly but slowly bent, and the reduction is soon effected. It may also be accomplished by placing the arm around the post of a bed, and by forcibly bending it, while it is thus confined."

Later, Scudder wrote:

"As Stimson has so well insisted, in the reduction of any dislocation, the dislocated bone should be reduced by the same path along which it came when dislocated. A haphazard method of reduction of a dislocation is unsurgical."

Scudder described a good method of reducing a posterior dislocation:

"The best method of reducing a dislocation of the forearm backward, when uncomplicated, is by two steps: first, by completely extending the forearm thus freeing the coronoid from the olecranon fossa and the posterior surface of the humerus; and, second, by direct traction and then flexing. Reduction is best accomplished by the aid of an anesthetic."

It is usually accepted that backward dislocation of both bones of the forearm is the most frequent dislocation at the elbow and this injury is frequently seen.

As examples of this backward dislocation, I am reporting these cases.

Case 1.—J. P., a woman, aged fifty-seven, was visiting at a country place and on the evening of July 15, 1940, she was hurriedly called out of doors. As she stepped off the porch, she fell. In an effort to save herself, she fell on the outstretched left hand, injuring the left elbow. She was seen shortly after the injury and immediately brought to the hospital. X-ray examination showed a posterior dislocation of the left elbow. No other injury was demonstrated by the x-ray. The patient was immediately given a general anesthetic and the dislocation was reduced without difficulty. The arm was put up at an angle somewhat less than a right angle and supported with a sling. The flexion of the forearm was limited by means of adhesive plaster carried around the arm and forearm. After a week, the adhesive plaster was removed. The arm was carried in a sling and some motion was allowed. The patient had an uneventful convalescence and the end result was entirely satisfactory.

Slide 2. This illustrates two views of the backward dislocation. It will be noted that both the radius and the ulna are displaced backward. The coronoid process rests in the olecranon fossa. Anteroposterior view shows that both bones are dislocated backward. There appears to be no separation of the radius and ulna.

Case 2.—L., this patient was a woman fifty years old. During the evening of December 30, 1939, while

she was skating, she fell, injuring her right elbow. She immediately came to the hospital and was seen about one hour after the accident. X-ray disclosed a posterior dislocation. She was immediately given a general anesthetic and the dislocation was easily reduced. After reduction, the arm was placed in a sling. There was no tendency toward recurrence of the dislocation. Convalescence was uninterrupted, and the final result was satisfactory.

Slide 3. This shows two views of the posterior dislocation of the forearm and elbow. There is no evidence of fracture. There is considerable lateral displacement of the radius and ulna on the humerus. The coronoid process is resting in the olecranon fossa.

Case 3.—W., this patient was a woman, aged thirty-seven. She was thrown from a horse on the evening of July 4, 1940, and sustained an injury to the left elbow. She was brought to the hospital immediately. X-ray examination showed a posterior dislocation. Three hours after the injury, she was given a general anesthetic, and the dislocation easily reduced. The arm was held in moderate acute flexion with adhesive. It was kept in position for 10 days and the adhesive plaster was then removed. The arm was carried in a splint for another week. Moderate active motion was encouraged after ten days. The patient made an uneventful recovery and the final result was satisfactory.

Slide 4. This picture shows another posterior dislocation at the elbow. The coronoid process is posterior to the lower end of the humerus.

Case 4.—F. J. This was a fifteen-year-old girl. On January 3, 1940, while at home, she fell striking against the right hand. She immediately complained of her elbow. She was seen shortly after the accident. At that time she complained of acute pain on the inner side and in front of the right elbow. There was swelling in this region. X-ray picture showed that there was a fracture of the tip of the coronoid. It would seem that this patient very narrowly escaped a posterior dislocation. There was sufficient strength, however, to prevent the dislocation. The only damage was a fracture of the tip of the coronoid. With immediate immobilization and after-treatment, this patient made a good recovery.

Slide 5. This roentgenogram shows the tip of the coronoid fractured with some slight separation.

The next case which I will describe illustrates what seems to be a rather rare lesion of the elbow.

Case 5.—The patient (Carl S., Jr.) was a fifteen-year-old high school student. On August 18, 1940, this young man fell from a step ladder injuring the right elbow. He was seen two hours after the injury. It was evident that there was a severe injury to the elbow. A roentgenogram was immediately taken. The x-ray picture showed a partial dislocation of the elbow joint with a separation of the internal epicondyle. The separated fragment was dislocated downward and appeared to be in the sigmoid cavity of the ulna and between the ulna and trochlea.

The patient was given a general anesthetic and an attempt was made to correct the position of this fragment. Later, x-ray disclosed that this maneuver had not been successful and the fragment was still in practically the same position.

The following day, 24 hours after the injury, open operation was done under a general anesthetic. Incision was made along the inner border of the olecranon. The ulnar nerve was displaced forward and the joint opened. A fragment from the internal epicondyle was found in the joint in the position as indicated by the x-ray. It was freely movable but attached by a firm band to the muscular insertion of the inner condyle. The attachment was cut and the fragment removed. The partial dislocation of the elbow was reduced and the wound closed. Recovery was uneventful and full function was restored.

Slide 6. This x-ray picture was taken immediately after the injury and shows two views of the injured elbow; anteroposterior and lateral views. The fragment can be seen in both of these views. It will be noticed that the lower end of the humerus shows where the epicondyle has been removed; pulled loose from its attachment.

Slide 7. This shows two views of this same elbow after operation. The dislocation has been reduced. The fragment has been removed. The absence of the internal epicondyle from the humerous is still noticeable.

Slide 8. This diagram was taken from Barbara Stimson's recent book on fractures and dislocations. It illustrates the position that this fragment took in this case. The internal epicondyle was torn loose and was brought down, possibly by muscle pull into the position shown by the heavy lined fragment in the picture.

This injury was recently described by Barbara Stimson:

"A common injury in childhood, this fracture is caused by forcible abduction of the forearm, tearing of a ligament, usually the epiphysis by muscle pull. It may be associated with dislocation of the elbow joint."

She also says that the fragment may, on rare occasions, be pulled out and lie between the ulna and trochlea as in this case.

Wilson says of this condition:

"The fracture line in the case of the lateral epicondyle may be extra capsular as the capsule is attached about its tip."

This case illustrates a separation of the lateral epicondyle with dislocation in the joint and is of special interest. It is probably quite rare. I believe that the best treatment is open operation with reduction of the fragment. If the reduction cannot be maintained, and particularly if the patient has completed his growth period, the fragment may be removed.

The incision used in this case was just internal to and parallel to the olecranon. It was very satisfactory. It was interesting to note that the fragment in the joint was firmly attached to its original site by a remnant of muscular insertion.

Slide 9. This illustrates the Van Gorder incision for old dislocation of the elbow joint. This picture was taken from Van Gorder's recent article. The vertical incision is made over the olecranon and extended upward. The tendon of the triceps is exposed and the incision is made across the triceps. In this way, a

complete exposure is made of the elbow joint. This incision is probably useful when a more complete exposure of the elbow joint is needed, as in neglected dislocation of the elbow joint.

DIABETES WITH INFARCTION OF THE SPINAL CORD

George N. Ruhberg, M.D.
and
John F. Noble, M.D.
Saint Paul

Neurologic manifestations in diabetes mellitus are usually due to changes in the peripheral nerves. Spinal cord complications are usually caused by: (1) degeneration of the motor cells of the brain stem and spinal cord, (2) degeneration of the intramedullary portion of the dorsal root fibers with secondary system degeneration producing a lesion like tabes dorsalis; (3) funicular degeneration of the posterior column. All these complications are usually imtimately associated with the arteriosclerosis of diabetes. Because of the character of the vascular lesion and the extensive cord destruction it was thought the following case report was justified:

M. H., a single woman of fifty-nine, several weeks before admittance to Ancker Hospital, experienced pain of the right foot and discoloration of the right first toe. A diagnosis of diabetes and gangrene was made and hospitalization and management of this condition was carried out for six weeks. On discharge she was receiving 40 units of Insulin daily and was on a diet. The third morning after her discharge on sitting up in bed she was seized with such a sharp pain in the small of her back that she could not move for some time. It gradually eased and passed away within an hour. By that time numbness and paralysis had developed in both lower extremities from the hips down. She was then admitted to the hospital.

On examination the objective findings were: (1) flaccid paralysis of both lower extremities; (2) a discolored spot, the size of a quarter, on the right great toe; (3) sensations in all fields absent below right costal margin; marked loss of sensation in same distribution on left; (4) absent Achilles and patellar reflexes, slight plantar flexion both lower extremities, and absent abdominal reflex. The urine had 1% sugar and a trace of albumen. White blood count was 11,800. Spinal fluid was slightly turbid and had a trace of globulin; cells 680; 723 mgs. % of chlorides; 43.9 mgs. % protein; a negative Wassermann. She was placed on a diabetic regime and was controlled adequately only after medical consultation. Subjective tingling appeared in the lower extremities, but the flaccid paralysis remained. She expired on the eleventh hospital day.

The gross anatomic findings at autopsy were as follows.

The tip of the right great toe showed a discolored, crusted lesion, apparently a healing gangrenous lesion.



Fig. 1. Low magnification view shows marked hyaline thickening of the intima of the arterioles. Note the marked narrowing of the lumen of the vessel.



Fig. 2. Higher magnification of the lesion shown in Figure 1.

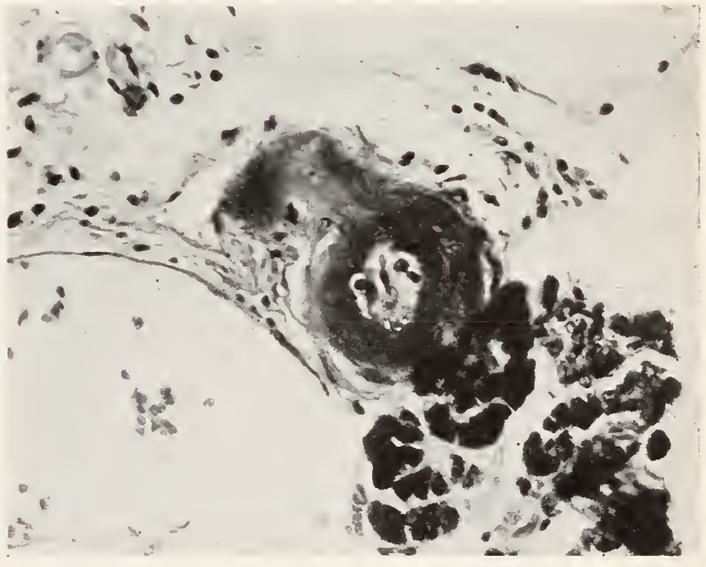


Fig. 3. Hyaline thickening of the arterioles of the pancreas. The lesion is similar to those seen in the spinal cord substance and similar lesions were found in other organs.

The leg was somewhat livid and on the lateral surface of the leg over an area about 5 cms. in diameter, numerous blebs were seen. The picture in the leg was that of a severe phlebitis or possibly arterial occlusion. The veins of the right leg were not dissected out, but the leg was milked upward and no thrombi could be

expressed. Over the sacrum there was a deep decubitus ulcer measuring 8x9 cms. Examination of the thoracic and abdominal viscera showed only the following positive findings. There was a large antemortem thrombus filling both the right and left branches of the pulmonary artery. This thrombus was not adherent and from its size it had probably had its orgin from the large veins of the lower extremity. The gall-bladder was thickened and contained numerous stones. There was no evidence of obstruction to the common bile duct. The uterus contained several small leiomyomata.

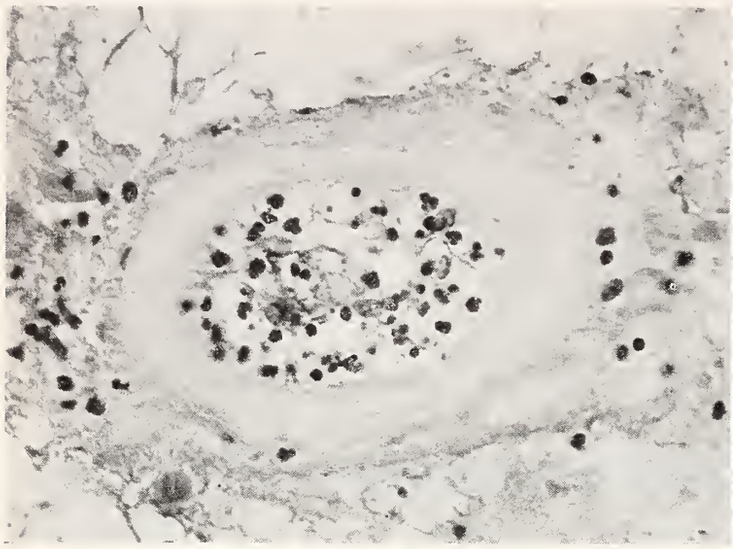


Fig. 4. Endarteritis with the proliferation of the intima and the infiltration of the vessel wall with acute inflammatory cells.



Fig. 5. A thickened arteriole with an occlusion of the lumen by a fresh thrombus.

The most interesting gross findings were observed when the spinal canal was opened. Here, it was found that there was a complete infarction of the spinal cord from the lower thoracic region downward to the terminal cord. In the thoracic region the spinal cord was found to be markedly softened and in the lumbar and sacral areas it showed complete dissolution. The process was, however, not sharply demarcated in the thoracic cord. In this area the marking of the cord gradually disappeared and the consistency of the cord became much more soft in the lumbar and sacral areas. The visible arteries of the spinal cord showed no abnormalities and examination of the brain showed no evidence of abnormality.

Microscopic examination of the spinal cord revealed the underlying etiology of the infarction. For the most part the cord structure was completely destroyed in the involved areas and three distinct vascular lesions were found to be present in the arterioles of the cord substance. The fundamental lesion is one which has been described by Dr. Bell as being almost pathognomonic of diabetes mellitus. The lesion is hyaline thickening of the intima of the arterioles which markedly narrows its lumen and in places practically occludes it. The width of the hyaline band and its homogeneous appearance are the distinctive characteristics of the lesion (Fig. 1 and 2). Arteriolar lesions of this type are found not only in the spinal cord, but also in the other organs chiefly pancreas (Fig. 3), spleen and kidneys. In addition to this lesion the arterioles of the spinal cord substance also showed an endarteritis in certain regions (Fig. 4). The arterioles of this type show an intimal proliferation and a distinct infiltration of the arteriole wall by acute inflammatory cells. In certain regions also the small arterioles show definite thrombi (Fig. 5). The more chronic lesions, namely the hyaline thickening of the arterioles and the endarteritis, could explain the infarction of the spinal cord but they are hardly an adequate explanation of the clinical picture of a transverse myelitis of extremely sudden onset. This clinical picture is better explained, I believe, by the thrombotic lesions.

Discussion

Dr. Gordon R. Kamman, Saint Paul: Some one once said that to the clinical neurologist there is no term more euphonious than myelitis. One neurologist called it—"a heterogeneous subgroup of a larger heterogeneous group." I think this is borne out clinically. The pathological findings in this case do not prove to me that we are dealing with a massive capillary thrombosis of the cord. The blood supply of the spinal cord is plexiform so if there is a shutting off of one or more of the extraspinal vessels we do not see a sharp transition between the normal and the softened cord. In other words, the pathological picture is not identical with that of a transverse myelitis resulting from trauma. Clinically, Dr. Ruhberg has shown us there is a lesion of the mid-dorsal cord and Dr. Noble has shown the upper dorsal cord is normal. There is a not too gradual transition between normal cord and pathological nerve tissue. Why one must invoke an unknown clinical entity to explain the softened condition of the cord below the mid-dorsal region, is difficult for me to see. The cervical and upper dorsal cords are supplied by the anterior spinal arteries which arise from the vertebrals before they join to form the basilar artery. The lower cervical and dorsal cords are supplied by the intervertebral arteries which arise from the arch of the aorta and the subclavian arteries. The lower dorsal and the lumbar and sacral portions of the cord are supplied by vessels arising from the descending aorta. Inasmuch as arteriosclerosis affects the descending portion of the aorta we see arteriosclerotic changes in the lower part of the cord. Before concluding that this is the rare condition that Dr. Noble suggests, I would like to see serial sections of the anterior spinal arteries and possibly of the lateral spinal arteries. This is a very interesting case and it has been well presented.

Dr. Noble (in closing): I think Dr. McKinley's suggestion that we are dealing with two processes is true. The thrombosis and the endarteritis may be explained as he has suggested on a strictly infectious basis and in all probability the portal of entry was, as he says, the gangrenous toe or perhaps the decubitus ulcer.

In answer to Dr. Kamman's suggestion, I neglected to mention that the anterior spinal artery was carefully examined both grossly and in microscopic section. While this artery shows evidence of mild sclerosis with slight calcification, we are unable to show any evidence of thrombosis.

PRIMARY CARCINOMA OF THE URETER
(Second Follow-up Report)

F. E. B. Foley, M.D.
Saint Paul

Before Dr. Ireland presents the case report scheduled on the program this evening, I shall give very briefly a promised "second follow-up report" on a previously reported case of primary carcinoma of the ureter.

Some of you will recall that the original report of this case to the Academy was made November 9, 1938. Nephro-ureterectomy with excision of a piece of bladder wall surrounding the ureteral orifice was made in a woman aged sixty-nine, because of primary carcinoma affecting a considerable segment of the pelvic portion of the ureter. There was no evident extension of the growth through the ureteral wall and it was felt the surgical procedure was well calculated to permanently eradicate the growth. At the time of this first report, four months after operation, it was said, "Pelvic examination disclosed a small mass in the former position of the terminal portion of the right ureter. Whether this represented induration of the repair process or recurrence of the neoplasm was not certain at that time."

At the first follow-up report November 8, 1939, it was said, "The mass in the right side of the pelvis gradually became larger and it became evident that it represented recurrent growth of the neoplasm. Cystoscopy showed invasion of the bladder floor on the right side. A full course of deep x-ray treatment was administered by Dr. Schons. This does not appear to have had a favorable effect for at the last pelvic examination, October 17, 1939, the mass in the right side of the pelvis was definitely larger and cystoscopy showed some extension in the bladder." [At the time of this first follow-up report it was neglected to say that a biopsy from the "recurrent" growth in the bladder showed on histologic examination, only "Papilloma of the Urinary Bladder." The important bearing of this finding was neglected and actually the finding was discounted on assumption the growth actually represented recurrence of the ureteral tumor with invasion of the bladder.]

It was evident from the above that further progress of the growth to an eventually fatal outcome was anticipated.

The subsequent course has been surprising. On December 19, 1939, the patient reported she felt better in general than for a considerable time, had a good appetite, was gaining in strength and had no urinary symptoms. Pelvic examination showed the mass in the right side of the pelvis to be distinctly smaller than previously. Cystoscopy at this time showed four separate areas of tumor growth.

On March 4, 1940, there appeared to be a little further diminution in the size of the pelvic mass while cystoscopy showed very definite increase in the size of the bladder growths. A second full course of deep x-ray therapy was administered by Dr. Schons, but had no effect whatever on the bladder growths.

In August, 1940, there was profuse and persistent hematuria. For control of this, transurethral excision and electrocoagulation of the bladder tumors were made. Again histologic examination of the removed tissue showed only "papilloma, histologically benign."

Since the above the pelvic mass has not enlarged, cystoscopic examinations have shown no recurrence of the bladder tumors and the patient appears to be well.

It is evident that actually there were two separate and distinct tumors. The primary carcinoma of the ureter appears to have been cured by surgical excision and deep x-ray therapy. Benign papillary tumors of the bladder, misinterpreted as representing recurrence of the ureteral growths, were not affected by the irradiation but appear to have been permanently eradicated by transurethral excision and electrocoagulation.

AN UNUSUAL UROLOGIC CONDITION

Harry Ireland, M.D. (by invitation), and
Frederic E. B. Foley, M.D.

The case to be reported is that of a married woman, aged thirty-four, admitted to the Miller Hospital on May 26, 1940, and discharged June 21, 1940.

Complaint.—Cloudy urine, increased frequency of urination, burning on urination.

Present Illness.—In the summer of 1939 there was a period of amenorrhea for three months, followed by scant vaginal bleeding beginning in July. This continued until September 17, 1939, when an operation was performed for "an abscess of the abdomen."

(A clear account of the findings at operation and just what was done could not be obtained.) The patient stated she was very "septic" at the time and the incision drained for three weeks.

One month following the pelvic operation a dilatation and curettage were made. Following this pyuria, frequency of urination and burning on urination developed and occasionally blood was seen in the urine. Menstruation was reëstablished but the flow was less and of shorter duration than formerly.

Examination.—(Significant findings only.) Temperature 98.8°, urine 60-70 pus cells per high power field, culture of bladder urine showed staphylococcus aureus, leukocytes 9,300.

Palpation of the abdomen disclosed tenderness in the right lower quadrant and a suggestion of a mass in this location. On pelvic examination an orange-size mass was felt close to the uterus on the right side.

Cystoscopy showed slight inward bulging of the right postero-lateral wall of the bladder. The mucosa over this area was hyperemic and at its center was a small rosette of papillary granulations. From the center of the granulations thick pus exuded, especially in response to pressure over the right lower quadrant. Tissue removed from the papillary rosette on histologic examination showed only inflammatory changes.

The urinary tract radiograph showed on the right side, within the pelvic ring, two small linear shadows each one about 1.5 cm. in length and 2 mm. in width. These shadows occupied a position somewhat medial to the normal position of the midportion of the pelvic ureter and did not appear to represent ureteral stones.

With a bulb catheter held snugly against the small opening at the center of the rosette of granulations, contrast medium was injected and both kidney pelves were filled with contrast medium through ureteral catheters.

The bilateral pyelo-ureterograms and "outlined perivesical cavity" film showed a cavity about 4 cm. in diameter communicating with the bladder and appearing as a mottled shadow, suggesting content of thick semi-fluid material permeated by contrast medium. The small linear shadows localized in this cavity. Above this cavity the contrast medium appeared in another sharply defined dense shadow about 6 cm. long in vertical direction and 2 cm. in width in transverse direction. In addition to these accumulations of the contrast medium there was another irregular shadow overlying the right side of the sacrum. The left renal pelvis and ureter were normal. The right renal pelvis was dilated grade 1. The ureter was also dilated from the uretero-pelvic junction down to the pelvic brim, while below this point the ureter was of normal caliber. There was no evidence of any communication between the ureter and the previously described perivesical cavity.

The history and findings appeared to warrant a fairly confident diagnosis: Ectopic pregnancy with fetal death, infection and fistulous communication with the bladder.

Operation.—Mid-line incision below the umbilicus. Extra-peritoneal exposure of the bladder. The peritoneum was stripped away from the right posterolateral wall of the bladder exposing the site of the fistulous opening. A small accumulation of granulation tissue was present between the peritoneum and the bladder wall at the site of the small opening into the bladder. Lying in this granulation tissue were several small fetal bones, among them two long bones which apparently made the shadows described in the urinary tract x-ray film. In addition were a number of minute flat bones. Through the peritoneum an intra-peritoneal mass adherent to the right posterolateral wall of the bladder could be felt. This mass appeared to represent the perivesical cavity and right Fallopian tube which had been outlined by the contrast medium. An elliptical section of bladder at the site of perforation was removed and the bladder was closed. The peritoneum was then opened and a right Fallopian tube, containing the ectopic pregnancy close to its junction with the uterus and adherent to the bladder, was removed.

The operation was followed by an uneventful convalescence.

With the recent reappearance in the literature of several case reports dealing with suppuration as a complication of ectopic pregnancy, an old subject has again taken on new life.

Adair states that the first recorded ectopic pregnancy of any type is that of Albucasis, the Arabian physician, who, about the middle of the Eleventh Century, observed an "abdominal swelling which suppurated, opened and discharged a fetal skeleton."

The first case of extra-uterine pregnancy reported in America was that of John Bard, who in a paper read in London on March 24, 1760, described the case of a twenty-eight-year-old woman who retained a full term fetus throughout a succeeding normal pregnancy. Following her delivery of a normal child, Bard noted fluctuation in the "large hard indolent tumor," and the temperature was elevated. At operation fetid pus and a fetus which had died at term, were extracted.

W. Baynham and J. Augustine Smith each reported cases in the New York Medical and Philosophical Review in 1809 of retained ectopic pregnancies which suppurated and formed sinuses through the abdominal wall. The fetuses were removed followed by recovery of the patients.

Lawson Tait, in 1888, called attention to the fact that infected hematoceles were always the products of suppurating ectopic pregnancies which he believed had ruptured into the broad ligament.

Berry Hart in 1893 advanced the theory that infection in these cases occurred as a result of the close application of the gestational sac to the rectum. This view is expressed in many other writings on the subject but has recently been questioned by Falk, who reported a series of ten cases which had come under his observation within a period of eight years. Falk believes that the most common source of infection is from previous intra-uterine manipulation but concedes that infection may come from the rectum, intestines or from a coexisting salpingitis. He believes that the process begins with encystment of the blood followed by a fusion of the wall of the mass with the adjacent layer of visceral or parietal peritoneum. A mortality of 20 per cent is described in this series of cases of simple suppurating ruptured ectopic pregnancy.

Since cases of ectopic pregnancy are now usually recognized early in their course and come to immediate surgery, few progress to the stage described in 1876 by Benhan, who reported a case of extra-uterine pregnancy which discharged a macerated fetus of five months into the rectum. He believes that there were many comparable cases which ruptured into the bladder. This was but an opinion, however.

Chatterjee, in 1918, reported a case of four- to five-month ectopic pregnancy which burst into the rectum.

Clark, in 1932, cited a case of an extra-uterine pregnancy complicated by rupture into the sigmoid, which had adhered to the uterus subsequent to a previous operation.

Schewkt, in 1931, reported a seven-month pregnancy in which the fetus, after lying in the abdomen for three months post-rupture, eroded via the umbilicus, discharged a fetal tibia and required later operative removal of the remainder.

Brown is of the opinion that rupture of a simple pelvic abscess into the bladder is rare and Delbet, in reporting on one thousand cases of pelvic suppuration, stated that 12 per cent rupture into the rectum, 5.22 per cent into the bladder, 4.59 per cent into the vagina and 3.22 per cent to the skin. Levitsky, reporting on four thousand cases of puerperal disease, noted no perforation of the bladder. Abscesses of varied origin, however, have been reported to produce perforation of the bladder. Among these Heller reported a series of forty pelvic abscesses with rupture to the bladder, the abscesses emanating from infected dermoids, and Ewell added one comparable case from his practice and warned of the gravity and seriousness of such a complication.

Gustafson et al., in 1932, reported a case in which

the skeletal bones of a five-month-retained skeletonized fetus was extracted from the rectum. The clavicles, ribs, head bones and parts of the long bones were so removed and the patient recovered.

Alcorta, Lopez and Zamora, in 1937, reported the elimination of fetal bones through the bladder in a case from their practice. This case was further complicated by the presence of a vesicosigmoidal fistula and vesical lithiasis.

Kauffman, Finley and King, in 1938, also reported a case of a thirty-seven-year-old multipara who was first seen seven months following her last menstrual period at which time she complained of dysuria, milky urine, hematuria (on one occasion), occasional sudden urinary obstruction, passage of gravel in the urine and five attacks of colicky right flank pain, the pain radiating to the thigh. Malaise had been noted but no chills or fever. Upon examination a bone was found protruding from the urethral orifice and later four more bones were thus removed. A firm indurated mass was noted in the region of the right side of the bladder and right Fallopian tube. The urine contained blood and pus. X-ray examination revealed partially ossified and calcified material, pyelograms were normal and cystoscopy revealed a bullous edema in the right upper quadrant of the bladder. At operation a sinus tract was found perforating the right broad ligament near its base and entering the right quadrant of the bladder. The case terminated fatally on the seventh postoperative day. The authors could find no comparable case in the literature. This case is given somewhat in detail because of its marked similarity to the case reported here.

Historically it is of interest that the first recorded cases of ectopic pregnancy both of ancient and modern times were those of the retained variety which subsequently suppurated and extruded through the abdominal wall. Furthermore, this condition of retention and suppuration is more fully described in the older obstetrical and gynecological texts than in the modern ones. This is probably to be explained on the basis of the present infrequency of unrecognized and non-surgically treated cases—the retention and suppuration thus not being allowed to develop. The complication itself is not rare, as illustrated by the series cited above.

The case here reported illustrates one of the possible occurrences in those cases where the fetal skeleton has become well formed. No attempt has been made here to arrive at the mechanism by which the infection is produced—the opinions are cited and the literature reviewed.

One must then conclude that a not infrequent sequel of neglected or undiagnosed ectopic pregnancy is suppuration, erosion and sinus formation to an adjacent organ—often a hollow viscus. The bladder would seem to be but rarely the site of such erosion. Cases of this type are difficult to diagnose and have a grave prognosis.

DEMONSTRATION OF QUADRUPLET PLACENTA

J. C. Litzenberg, M.D.
Minneapolis

By courtesy of Dr. J. F. Hanna, I had previously had the privilege of examining the x-ray plate of this pregnant woman who gave birth to quadruplets in Fargo, North Dakota, a few days ago. The x-ray plate was taken a month or more before she delivered. These multiple births of more than two, of course, are very dramatic and attract a great deal of attention. I want to say that Dr. Hanna, who took care of her, is a man of very high obstetric standing and has handled the situation in a very ethical manner.

The woman was due to deliver in March, but, as so often happens in these cases, the babies were born a month prematurely. The x-ray was a rather poor picture from the standpoint of x-ray photography but it showed four heads distinctly.

Dr. Hanna kindly sent the placentæ. The question is—whether there were two pairs of twins, one pair of twins and two other single pregnancies, four single pregnancies, or triplets and one single pregnancy. In fraternal twins there are always two placentæ. Identical twins have one placenta. Minute study of the placentæ and membranes only can determine just what transpired in this quadruple pregnancy. I shall take it to the University for detailed study. (The placentæ and cords were shown.)

The meeting adjourned.

E. V. Kenefick, M.D.,
Secretary.

EXPERIMENTAL STUDY OF SOLDIERS' CLOTHING

The Fatigue Laboratory of Harvard University, Cambridge, Mass., will undertake an experimental study under simulated field conditions of clothing for soldiers. Thirty volunteers will march on a treadmill for specified lengths of time between four and eight hours, but not oftener than once every ten days, wearing regulation army clothing and carrying full field equipment. Each of the thirty soldiers during these experiments will be subjected to studies of their water and salt balances and during the ten-minute rest periods will be weighed, have their feet examined and their temperature, pulse and blood pressure taken. The treadmill will be heated to simulate the heat of tropical countries, and the soldiers' fatigue reaction will be checked carefully. Conditions in the treadmill will be adjusted also to simulate conditions in various other climates. Efforts will thus be made to discover the best types of underwear, socks, shoes and later other articles of clothing. A study of the treatment of foot ailments will also be undertaken, as well as the possibility of replacing leather soles of shoes with cork or rubber or some other compound.—*Jour. A.M.A.*, May 10, 1941.

OF GENERAL INTEREST

A daughter, Mary Catherine, was born to Dr. and Mrs. Emmet N. Milhaupt of Minneapolis, April 22.

* * *

Dr. and Mrs. A. V. Stoesser of Minneapolis are the parents of a son born, April 30.

* * *

A son was born to Dr. and Mrs. William R. Murlin of Saint Paul, April 28.

* * *

Dr. and Mrs. Larry Sass of Milwaukee were guests of Dr. and Mrs. F. M. McCarten on April 28.

* * *

Orders for Dr. Albert T. Hays, first lieutenant, Minneapolis, to report for extended active duty with the United States Army, have been revoked.

* * *

The weekly public health lectures, which have been presented in Rochester by physicians there for the past twenty years, have been discontinued.

* * *

Dr. Paul F. Dwan has returned from Florida, where he and his family spent the winter, and he has resumed his practice in Minneapolis.

* * *

Dr. James M. Hayes of Minneapolis announces the removal of his office to 1033-35 Medical Arts Building, Minneapolis.

* * *

Dr. William R. Lovelace II of Rochester presented four addresses at the fifty-ninth anunual meeting of the New Mexico Medical Society in Raton, May 26-28.

* * *

The marriage of Dr. G. Willis Bass, Minneapolis physician, and Mrs. Frank E. Hills of New Hampshire, took place in Minneapolis, May 18.

* * *

Mrs. Norman H. Baker (Dr. Maria Lieber Baker) of Fergus Falls is state chairman of the 1941 Health and Summer Round-Up of the Minnesota Congress of Parents and Teachers, Inc.

* * *

Dr. Everett K. Geer of Saint Paul was elected to the council of the National Tuberculosis Association at the association's opening session, May 5, in San Antonio, Texas.

* * *

Dr. Leon H. Flancher has resigned his position as staff physician at the Sand Beach Sanatorium in Lake Park, Minnesota, effective August 1. Dr. Flancher has been at Sand Beach since March, 1925.

* * *

Dr. Berton J. Branton of Willmar addressed the March meeting of the Polk County Medical Society in Amery, Wisconsin, on the subject, "The Rôles of Physician and Pharmacist."

Dr. F. E. Harrington of Minneapolis has been chosen to welcome the papal legate at the Eucharistic Congress in Saint Paul this month, as representative of the laity.

* * *

Dr. H. A. Smedal of Rochester has been ordered to the naval air station in Pensacola, Florida, with the grade of lieutenant (junior grade), United States Navy.

* * *

Among new fellows of the Mayo Foundation in Rochester is Dr. Robert T. Potter of Minneapolis, a graduate of the University of Minnesota Medical School.

* * *

Dr. John L. McKelvey, head of the department of obstetrics and gynecology at the University of Minnesota Medical School, addressed a meeting of the Inter-Urban Academy of Medicine in Duluth, May 14. His subject was "Arteriosclerotic Toxemia of Pregnancy."

* * *

Election of Dr. Cecil J. Watson of Minneapolis and Dr. A. R. Barnes of Rochester to membership in the Association of American Physicians is announced. The association conducted its annual meeting in Atlantic City, New Jersey, last month.

* * *

Dr. W. A. O'Brien, director of postgraduate education at the University of Minnesota Medical School, spoke before the Jackson County Health Forum at Kansas City, May 21, on the subject, "Medicine Meets Middle Age Needs."

* * *

Included on the program at the seventieth annual session of the California Medical Association in Del Monte, May 5-8, was Dr. Waltman Walters of Rochester, who presented a paper, "Surgery of Adrenal Tumors."

* * *

Dr. Allen E. Magnuson, who has been associated with the Oliver Clinic in Graceville for the past two years, has established offices for the practice of medicine in Wheaton. Dr. Magnuson is a graduate of the University of Minnesota Medical School.

* * *

At the annual clinic of the Ingham County Medical Society in Lansing, Michigan, May 1, Dr. John S. Lundy of Rochester presented a paper, "The Choice of an Anesthetic," and Dr. Owen H. Wangensteen of Minneapolis spoke on "Management of Abdominal Distention."

* * *

Taking part in the eighty-second annual meeting of the Kansas Medical Society in Topeka, May 13-15, were Dr. Roger L. J. Kennedy of Rochester who spoke on "The Significance of Vomiting and Diarrhea in Infants

(Continued on Page 502)



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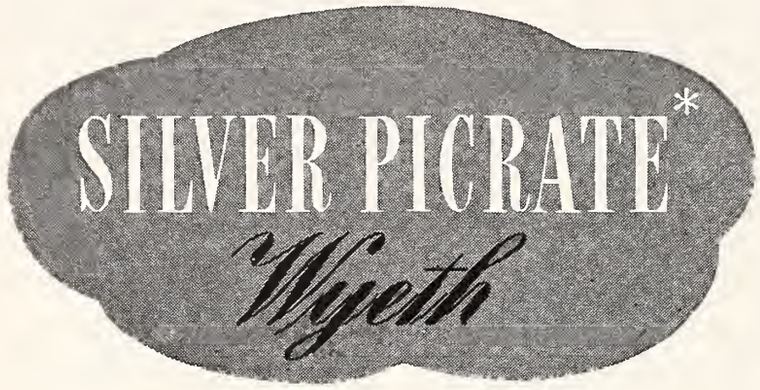
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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., **23,** 201 (March), 1939.

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(Continued from Page 500)

and Children," and Dr. Albert M. Snell of Rochester, "Changing Conceptions of Portal Cirrhosis."

* * *

Dr. A. V. Stoesser of Minneapolis attended the meeting of the American Association for the Study of Allergy in Cleveland, June 2-4. Dr. Stoesser addressed members, June 3, on the subject, "The Influence of Acute Infections in the Progress of Infantile Eczema."

* * *

Two fellows in surgery in the Mayo Foundation have been ordered to active duty in the Canadian military service. They are Dr. J. M. James, who has been assigned to the medical branch of the Royal Canadian Air Force; and Dr. W. J. MacArthur who has been assigned to the to the Canadian Army Medical Corps.

* * *

Drs. W. J. McCarthy and H. B. Grimes, who for a number of years have practiced medicine in Madelia under the firm name of McCarthy & Grimes, are dissolving partnership. After June 15, Dr. Grimes will have offices in his own building, while Dr. McCarthy will maintain his office at its present location.

* * *

Among the distinguished guests who will present addresses and clinics at the ninth annual assembly of The Omaha Mid-West Clinical Society in Omaha next October will be Dr. Albert M. Snell of Rochester, basic sciences; and Dr. John L. McKelvey of Minneapolis, gynecology and obstetrics. The assembly is scheduled for October 27, 28, 29, 30 and 31.

* * *

Among those whose names appeared on the program at the Louisiana State Medical Society meeting in Shreveport in April were Dr. John D. Camp and Dr. Virgil S. Counseller of Rochester. The latter's subject was "A Consideration of the Fascia of Broad Ligament with Respect to Certain Surgical Procedures on the Pelvis."

* * *

Dr. Donald C. Balfour of Rochester, director of the Mayo Foundation, was honored by McMaster University of Hamilton, Ontario, May 19, when the honorary degree of doctor of science was conferred on him. Dr. Balfour is a past president of the American College of Surgeons.

* * *

Scheduled for release from publishers in June is a book, "The Control of the Communicable Disease" by Dr. Gaylord Anderson, head of the department of public health and preventive medicine at the University of Minnesota, and Miss Margaret Arnstein of New York City, former faculty member of that department.

* * *

Dr. William T. Peyton, head of the division of neurosurgery at the University of Minnesota Medical School, has returned from a two-months' clinical tour in the East. Among meetings which he attended was the 143rd annual session of the Medical and Chirurgical

Faculty of the State of Maryland in Baltimore, April 22 and 23.

* * *

Dr. Howard R. Ives, Jr., of Rochester, fellow in surgery in the Mayo Foundation for Medical Education and Research, is the first American physician to be accepted for service in Great Britain as a result of a call for volunteer doctors issued April 21 by the American Red Cross.

Dr. Ives, who has been in Rochester since January, 1940, will be in England for at least a year.

* * *

Presiding at the sixty-sixth annual meeting of the American Gynecological Society held in Colorado Springs, Colorado, May 26-28, was Dr. Jennings C. Litzenberg of Minneapolis, president. His presidential address was entitled, "Medicine in the Changing Social Order." Among the speakers was Dr. Robert D. Mussey of Rochester, whose paper was entitled "Pelvic Pain."

* * *

Dr. Charles A. Evans, associate bacteriologist at the University of Minnesota, has been named one of seven winners of fellowship awards totaling $13,600 for study of virus diseases. The award was announced by the National Foundation for Infantile Paralysis.

Dr. Evans' fellowship of $2,100 will provide a year's work at the University of Rochester, New York, under Dr. George P. Berry, virus expert.

* * *

When the Chicago branch of the American Association of Scientific Workers conducted a symposium on "Nutrition in Defense of Democracy," April 15, the guest speakers included Dr. Russell M. Wilder of Rochester, chairman of the committee on nutrition and foods of the National Research Council. Dr. Wilder's subject was "Nutrition in the United States—a Plan for the Future."

* * *

Speakers at the ninetieth annual session of the Iowa State Medical Society in Davenport, May 14-16, included Dr. Charles W. Mayo of Rochester, whose address was entitled, "Surgical Treatment of Carcinoma of the Lower Portion of the Colon," and Dr. Fredrick A. Willius, Rochester, who spoke on "Certain Considerations of Coronary Disease" and "The Recognition of the Normal Heart."

* * *

Dr. W. C. Alvarez of Rochester delivered the Alpha Omega Alpha lecture at the Women's Medical College of Pennsylvania in Philadelphia, May 7. He addressed the staff of Geisinger Memorial Hospital in Danville, May 8; a meeting of the Medical Society of the State of Pennsylvania in Williamsport, May 9, and a meeting of the Columbia Medical Society in Columbia, South Carolina, May 12.

* * *

In 1940 the maternal death rate in Minnesota was 2.2 per 1,000 live births, which was a reduction of .5 from 1939 and an all-time low figure. The infant death rate of 33.3 per 1,000 live births was a reduction of .2 over 1939. We would like to match these



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* * *

Election of two Rochester physicians, Dr. Philip H. Heersema and Dr. John Andrew Aita, to membership in the American Psychiatric Association has been announced by Dr. C. C. Burlingame of Hartford, Connecticut, chairman of the association's committee on public education. Dr. Heersema is a member of the staff of the Mayo Clinic and Dr. Aita is a fellow in neurology in the Mayo Foundation for Medical Education and Research.

* * *

The United States Civil Service Commission announces a need for nurses in the United States Public Health Service, the Indian Service and the Veterans' Administration for service in hospitals and other medical centers throughout the United States, Panama Canal Zone and Alaska. Further information may be obtained from the secretary, Board of United States Civil Service Examiners, at any first or second class post office.

* * *

Dr. Louis B. Wilson of Rochester, director emeritus of the Mayo Foundation, was elected an honorary member of the Drake University Gamma chapter of Phi Beta Kappa when he presented a paper, May 6, at the university in Des Moines.

Dr. Wilson has been asked to serve as consultant to the committee appointed by the National Board of Medical Examiners to study the question of certifying the general practitioner.

* * *

Dr. Asher S. Chapman, a fellow in medicine in the Mayo Foundation, has been awarded the Van Meter prize offered annually by the American Association for the Study of Goiter.

The award was made for the best essay submitted concerning original work on problems related to the thyroid gland. Dr. Chapman, a graduate of Northwestern University Medical School, began his fellowship in October, 1938.

Dr. W. L. M. King, a fellow in surgery in the Mayo Foundation, was given second honorable mention for his essay on thyroid tumors. Dr. King, who was graduated from the University of Toronto Medical School, began his fellowship in July, 1938. He plans to return to Toronto in July.

* * *

Guest faculty members at the University of Minnesota continuation course in Roentgen Diagnosis of Diseases of the Chest, May 22, 23 and 24, were Dr. LeRoy Sante, professor of radiology at St. Louis University School of Medicine, and Dr. Felix Fleischner, radiologist at Greenfield, Massachusetts, and formerly chief of the department of roentgenology at Wilhelmina Hospital in Vienna. Enrollment for the course was limited to physicians with special training in radiology.

Dr. H. S. Diehl, dean of the University of Minnesota Medical School, was in Chicago, May 30, to attend a meeting of the executive committee of the Association of American Medical Colleges.

In April Dr. Diehl was in Washington, D. C., to attend a three-day conference called by Surgeon General Thomas Parran of the United States Public Health Service to discuss the nation's health program in relation to national defense.

* * *

Dr. Leo G. Rigler, head of the radiology department at the University of Minnesota Medical School, will speak at three meetings within the next few weeks.

On June 1 he will address the Indiana Roentgen Ray Society in Indianapolis, and on June 17 he will address a meeting of the American Society of X-ray Technicians in Hollywood. He will speak also at a meeting of the Upper Peninsula Medical Association of Michigan in Ironwood, July 16, on the subject, "Roentgen Examination of Acute Abdominal Diseases."

* * *

Speaker at the graduation exercises of the St. Mary's Hospital School of Nursing in Minneapolis, May 11, was Dr. W. A. O'Brien of the University of Minnesota Medical School.

Dr. O'Brien also spoke at several high school commencement exercises, including the graduation class of Park Rapids High School, May 27; Ellendale, May 28; Sebeka, May 29; Eden Prairie, May 30; Coleraine, June 5. On June 6, he spoke at the graduation exercises of Holy Angels Academy in Minneapolis.

* * *

Physicians who took part in the Continuation Course in Nutrition in the Public Welfare given at the University of Minnesota Center for Continuation Study, May 26, 27, and 28, included Drs. Irvine McQuarrie, William A. O'Brien, Gaylord W. Anderson, Ruth E. Boynton, John Boehrer, Harold R. Leland, Owen F. Robbins, L. F. Richdorf, Macnider Wetherby, and John Meade, all of the University of Minnesota Medical School; and Dr. Ray D. Williams, Mayo Foundation fellow in medicine.

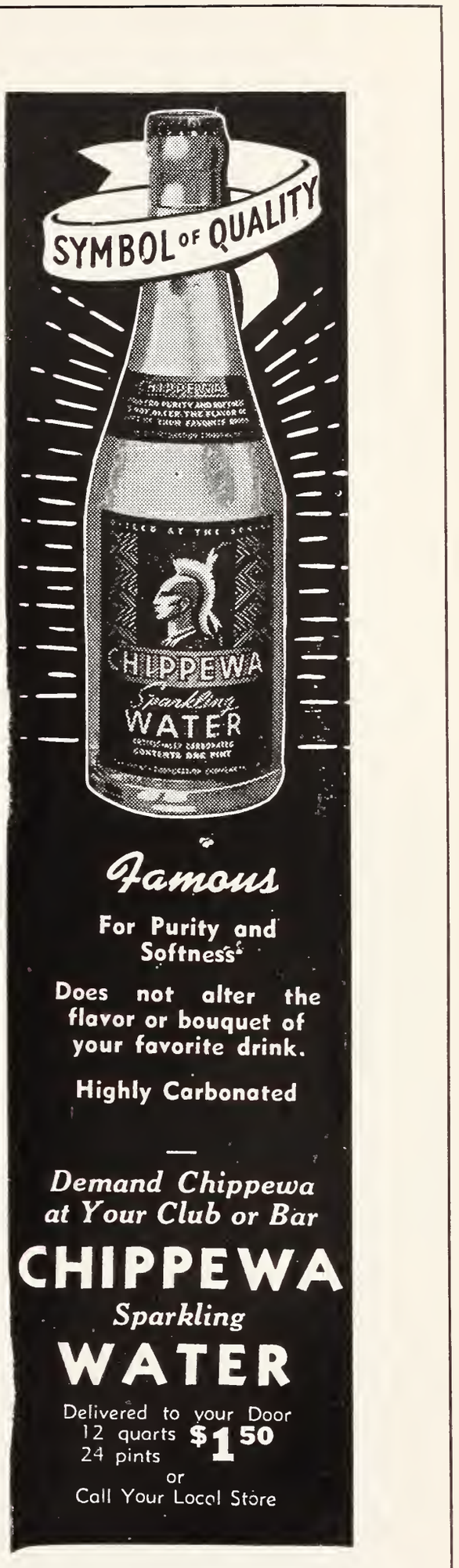
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Among the speakers at the annual meeting of the American Urological Association in Colorado Springs, May 19-22, were Drs. William F. Braasch, V. S. Counseller, J. L. Crenshaw and G. J. Thompson. Dr. Braasch presented a paper, "Prognosis in Bilateral Renal Tuberculosis," and Dr. Counseller, a paper, "Ten Years' Experience in the Management of Cryptorchidism."

Dr. Crenshaw presented an exhibit, "Anomalies of the Kidney and Ureter," while Dr. Thompson participated in the discussion of several papers.

* * *

The annual oration on medicine at the seventy-fourth annual session of the West Virginia State Medical Association, held in Charleston, May 12-14, was presented by Dr. J. A. Bargen of Rochester. His subject was



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FRACTURES & TRAUMATIC SURGERY—Two Weeks Intensive Course starting June 30. Informal Course every week.

GYNECOLOGY—Two Weeks Intensive Course starting October 20. One Month Personal Course starting August 25. Clinical Course every week.

OBSTETRICS—Three Weeks Personal Course starting August 4. Two Weeks Intensive Course starting October 6. Informal Course every week.

OTOLARYNGOLOGY—Two Weeks Intensive Course starting September 8. Informal Course every week.

OPHTHALMOLOGY—Two Weeks Intensive Course starting September 22. Informal Course every week.

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Dr. Edgar V. Allen of Rochester was another guest speaker, his subject being "Importance of Differentiating Psychoneurotic and Somatic Pain from Visceral Pain." Dr. Allen also addressed a meeting of the Philadelphia County Medical Society in Philadelphia.

* * *

As vice president of the Society for Pediatric Research, Dr. Arild E. Hansen of the University of Minnesota Medical School acted as chairman of several of the sessions at the organization's meeting in Atlantic City, New Jersey, May 5 and 6. Also attending this meeting was Dr. Roger L. J. Kennedy of Rochester, who presented a paper.

Dr. Hansen has been elected to membership in the Society for Clinical Investigation. This organization held its annual session in Atlantic City last month also.

* * *

An expansion and improvement program, to be worked out over a period of several years at an ultimate cost of between $150,000 and $200,000, is under way at St. Joseph's hospital in Saint Paul. Recently the hospital acquired the Capitol Annex, apartment building at St. Peter and Exchange Streets, and a tract with an 80-foot frontage on Tenth Street adjoining the hospital properties on that street. Four floors of the Capitol Annex, a ten-story structure, have been redesigned for use of the hospital personnel, and further changes for like purposes are contemplated.

* * *

Dr. Raymond Bieter, professor of pharmacology at the University of Minnesota Medical School, was recently elected secretary of the American Society for Pharmaceutical and Experimental Therapeutics.

Dr. Bieter is the third person from the University of Minnesota to have held that office. Others were Dr. Edgar D. Brown, associate professor emeritus of pharmacology, who is now living at Paynesville, and Dr. Leonard G. Rowntree, Medical Division, National Headquarters, Selective Service System, Washington, D. C.

* * *

Dr. Moses Barron, as president of the Minneapolis chapter of the American Friends of the Hebrew University in Palestine, presided at a meeting of that group May 12 in the Coffman Memorial Union, at which Dr. John L. McKelvey, head of the department of gynecology and obstetrics at the University of Minnesota Medical School, spoke. Other speakers included Dr. Theodore C. Blegen, dean of the University of Minnesota Graduate School, and Dr. Walter Fischel, professor of Oriental Studies at the Hebrew University in Palestine.

* * *

Papers were presented at the sixtieth annual session of the South Dakota State Medical Association in Mitchell, May 18-20, by six physicians from the Twin Cities. Speakers and their subjects included: Dr. Vernon L. Hart of Minneapolis, "Heredity and Disease of the Skeletal System"; Dr. Willis H. Thompson, Minneapolis, "Bleeding Tendencies in the Newborn and Their

Prevention"; Dr. Henry E. Michelson, Minneapolis, "The Relationship of Dermatology to General Medicine"; Dr. Frederic E. B. Foley, Saint Paul, "Diagnosis and Treatment of Bladder Neck Obstruction"; Dr. Robert G. Allison, Minneapolis, "Progress of X-ray Technique," and Dr. James B. Carey, Minneapolis, "Chronic Gastritis."

* * *

Six Minnesota physicians presented papers at the annual meeting of the North Dakota State Medical Association in Grand Forks, May 19-21. They were: Dr. Edward H. Rynearson of Rochester, "Vitamins"; Dr. Elexious T. Bell of Minneapolis, "Pathology of Heart Disease"; Dr. Macnider Wetherby of Minneapolis, "Therapeutic Procedures in Chronic Rheumatoid Disease"; Dr. Walter A. Fansler of Minneapolis, "Cancer of the Large Bowel"; Dr. Henry E. Michelson of Minneapolis, "Disease of the Skin"; and Dr. William A. Coventry of Duluth, "Management of the Breech."

* * *

Off the press are a series of books entitled, "Help Your Doctor to Help You," designed to give the interested layman practical information about the causes, nature, diagnosis and treatment of the disease covered. The series is sponsored by a board of medical authorities. Dr. Walter C. Alvarez of Rochester, professor of medicine in the University of Minnesota Graduate School, is editor-in-chief. Another Minnesota physician on the editorial board is Dr. Charles W. Mayo of Rochester. The five volumes are: "Gallstones and Diseases of the Gallbladder," "Migraine," "Food Allergy," "Colitis," and "Gastric or Duodenal Ulcer.'

* * *

The Minnesota Society of X-ray Technicians, seventy in number, held a meeting in Stillwater on April 26. At the luncheon in the Stillwater Club rooms, E. V. Strand, M.D., made the welcoming address on behalf of the medical staff of the Lakeview Memorial Hospital. During the afternoon C. H. Sherman, M.D., gave a lecture on "An Economical Polygraph," with demonstration. Dr. W. R. Humphrey officiated as toastmaster at the dinner in the evening.

* * *

The next examination for appointment as Assistant Surgeon, U. S. Navy, will be held at all Naval Medical Department activities August 11 to 15, 1941. Applications must be submitted by July 15, 1941. Applicants must have had at least one year of internship. For further information write to the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Examination for appointment as Acting Assistant Surgeon will be held June 23 to 26, 1941. Graduates of class A medical schools are eligible and those accepted after one year's internship in a Naval Hospital will be eligible for examination for appointment as Assistant Surgeon.

* * *

On April 23, Dr. and Mrs. D. Kalinoff and daughter Helen of Stillwater, returned from Biloxi, Mississippi, where they spent several of the winter months.

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Mumps and measles are the most difficult diseases the Army has to control today, Colonel Kent Nelson, who is in charge of the medical section of the University of Minnesota ROTC, told the public health nursing institute at the forty-ninth annual convention of the Minnesota State Conference of Social Work in Saint Paul, last month.

Other physicians who spoke included Dr. Ruth E. Boynton, director of the University of Minnesota Student Health Service and a member of the Minnesota State Board of Health, who was chairman of the meeting; and Dr. A. J. Chesley, secretary and executive officer of the Minnesota Department of Health, who spoke on "Responsibility of the State Department of Health in National Defense."

* * *

When the one hundred and first annual meeting of the Illinois State Medical Society was held in Chicago, May 20-22, three Minnesota men participated in the program.

Dr. Chester A. Stewart of Minneapolis presented a paper on "Tuberculosis: Its Two Clinically Demonstrable Phases of Development," and Dr. John D. Camp of Rochester presented a paper, "Osteoporosis and Its Relation to Systemic Disease." Dr. Owen H. Wangensteen, head of the department of surgery at the University of Minnesota Medical School, gave the oration in surgery, entitled "Rôle of the Surgeon in the Management of the Peptic Ulcer Problem."

* * *

Several medical students at the University of Minnesota were awarded honors at the Cap and Gown Day convocation, May 29.

Honors given by the Southern Minnesota Medical Association went to Floyd John Lewis, gold medal and $100 cash prize; and Norton Donald Ritz, certificate of merit.

The Rollin E. Cutts Memorial Prize of a gold medal and $25 was awarded Herman Kabat.

Lawrence Peters was reappointed to the Shevlin Fellowship in Medicine.

Elected to Alpha Omega Alpha, honorary medical fraternity, were: Norton D. Ritz, Jacob Jacoby, George N. Kraenier, F. John Lewis, Herman Kabat, William E. Harris, Lewis A. Vadheim, C. Walton Lillehei, Ben Irwin Heller, Eleanor Botha, G. Roy Diessner, Robert A. Green, Stanley P. Stone, Donald W. Freeman and George E. Montgomery, Jr.

* * *

Medical reserve corps officers ordered to extended active duty include:

Dr. Oscar Kozberg, first lieutenant, Moose Lake to Camp J. T. Robinson, Arkansas.

Dr. Alton Edwin Lindblom, first lieutenant, Minneapolis, Fort Crook, Nebraska.

Dr. Theodore Peter Mollers, first lieutenant, Mountain Iron, to Camp J. T. Robinson, Arkansas.

Dr. Robert Anthony Murray, captain, Aitkin, Engineer Replacement Center Infirmary, Fort Leonard Wood, Missouri.

Dr. Arthur Neumaier, first lieutenant, Lindstrom, fourth armored division, Pine Camp, Watertown, New York.

Dr. William Joseph Noonan, first lieutenant, Minneapolis, to Fort Leonard Wood, Missouri.

Dr. Ralph Victor Platou, first lieutenant, Minneapolis, C.A.S.C. Station Hospital, Fort Leonard Wood, Missouri.



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Dr. Maurice Lockhart Straus, first lieutenant, Saint Paul, 41st division, Camp Murray, Washington.

Dr. Donald Stark Branham, captain, Albert Lea, to 56th Coast Artillery Harbor Defenses, San Francisco.

Dr. Nathan Kenneth Jensen, captain, Minneapolis, Corps Area Service Command Station Hospital, Fort Snelling.

Dr. Robert Bruce Tubor, first lieutenant, Hibbing, to Camp J. T. Robinson, Arkansas.

Dr. Frederick Herman Wiechman, captain, Montgomery, to Station Complement, Fort Riley, Kansas.

Dr. James Leo Hanley, first lieutenant, Rochester.

Dr. Paul Christoph Doehring, Jr., first lieutenant, Rochester.

Dr. John Joseph Ederer, first lieutenant, Mahnomen, 9th Army Corps Troops, Fort Lewis, Washington.

Dr. Lloyd Clayton Gilman, first lieutenant, Atwater, 3d Army Corps Troops, Fort Ord, California.

Dr. Clarence Melchior Hartmann, first lieutenant, Fairfax, 3d Army Corps Troops, Fort Ord, California.

Dr. Stillman John Hathaway, captain, Proctor, 9th Army Corps Troops, Fort Lewis, Washington.

Dr. Walter Clinton Jump, captain, Kasson, 3d Army Corps Troops, Fort Ord, California.

Dr. Grant Edmund Olson, first lieutenant, West Concord, 30th Field Artillery, Camp Roberts, California.

Dr. Harry Allen Palmer, first lieutenant, Blackduck, Corps Area Service Command, Reception Center, Fort Snelling.

Dr. Ernest Sterling Palmerton, first lieutenant, Albert Lea, 85th Field Artillery, Camp Roberts, California.

Dr. David Howard Rolig, first lieutenant, Howard Lake, Corps Area Service Command, Reception Center, Jefferson Barracks, Missouri.

Dr. Leander Theodore Simons, captain, Saint Paul, Corps Area Service Command Station Hospital, Fort Leonard Wood, Missouri.

Dr. Lloyd Arthur Smith, first lieutenant, Balaton, 40th Field Artillery, Camp Roberts, California.

Dr. Clifford Theodore Wadd, first lieutenant, Janesville, 166th Station Hospital, Harbor Defenses, San Diego, California.

Dr. Richard Autie Whitney, first lieutenant, Cambridge, 30th Field Artillery, Camp Roberts, California.

* * *

Minnesota physicians who took part in the section programs of the ninety-second annual session of the American Medical Association in Cleveland, June 2-6, include:

Section on Practice of Medicine: Dr. Russell M. Wilder of Rochester, "Nutrition: A Public Health Problem"; Drs. George E. Fahr and J. S. LaDue of Minneapolis, "Therapeutic Efficiency of a Digitalis Glucoside, Digilanid C, in Congestive Heart Failure with Normal Sinus Rhythm" (lantern demonstration) —Dr. Arlie R. Barnes of Rochester opening discussion.

Section on Surgery, General and Abdominal: Paper, "Malignant Lesions of the Stomach: Importance of Early Treatment and Results" by Drs. Waltman Walters, H. K. Gray and James T. Priestley of Rochester. Dr. Charles W. Mayo of Rochester, opening discussion on "The Effect of Hot and Cold Applications to the Abdominal Wall and Also Hot and Cold Fluids Administered by Mouth on Gastric and Intestinal Secretory and Peristaltic Activity" by Dr. J. Dewey Bisgard of Omaha. Dr. James T. Priestley of Rochester, opening discussion on paper, "Embryoma of the Kidney" by Drs. William E. Ladd and Robert R. White of Boston.

Section on Obstetrics and Gynecology: Drs. Robert D. Mussey and Arthur B. Hunt of Rochester, "The Toxemias of Pregnancy: Their Classification an Aid to Management of Parturition."



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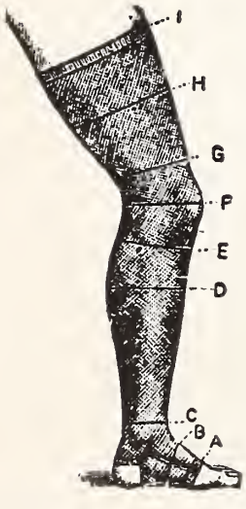
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Section on Ophthalmology: Dr. Henry P. Wagener of Rochester, opening discussion on "Retinal Phlebosclerosis" by Drs. Glen G. Gibson and Lawrence W. Smith of Philadelphia. Dr. Walter H. Fink of Minneapolis, discussion on paper by Dr. Hermann M. Burian of Hanover, New Hampshire, concerned with fusional movements in permanent strabismus.

Section on Laryngology, Otology and Rhinology: Dr. Horace Newhart of Minneapolis, opening discussion on paper, "Problems of the Hard of Hearing in Industry" by Dr. W. E. Grove of Milwaukee. Dr. Gordon B. New of Rochester, opening discussion on paper, "Diseases of the Salivary Glands" by Dr. A. C. Furstenberg of Ann Arbor. Dr. Anderson C. Hilding of Duluth, opening discussion on paper, "Prophylaxis of the Common Cold" by Dr. Theodore E. Walsh of St. Louis.

Section on Pediatrics: Paper by Drs. George B. Logan and Edward J. Baldes of Rochester, "Parallel Clinical and Electro-encephalographic Improvement in Epilepsy." Paper, "Hyperthyroidism in Childhood" by Dr. Roger L. J. Kennedy of Rochester.

Section on Pharmacology and Therapeutics: Discussions on various papers to be opened by Dr. N. W. Barker, Dr. Charles H. Slocumb, Dr. F. P. Moersch, Dr. Arlie R. Barnes and Dr. N. M. Keith of Rochester, and Dr. Moses Barron of Minneapolis. Paper, "Some Effects of Potassium Salts in Man" by Drs. N. M. Keith, A. E. Osterberg and H. B. Burchell of Rochester. Paper, "Therapeutic Effect of Diaminosulfone Glucoside on Experimental Tuberculosis" by Drs. W. H. Feldman and H. C. Hinshaw of Rochester. Paper, "Therapeutic Efficiency of a Digitalis Glucoside, Digilanid C, in Congestive Heart Failure with Normal Sinus Rhythm" by Drs. George E. Fahr and J. S. La Due of Minneapolis. Dr. Edgar V. Allen of Rochester is secretary of this section.

Section on Pathology and Physiology: Dr. Maurice B. Visscher of Minneapolis, member of the executive committee. Dr. Frank C. Mann of Rochester, paper, "The Liver and Medical Progress."

Section on Nervous and Mental Diseases: Dr. Henry W. Woltman of Rochester, opening discussion on papers by Dr. C. Hunter Shelden of Pasadena, California, and Dr. Russell N. DeJong of Ann Arbor. Dr. E. J. Baldes of Rochester, opening discussion on paper by Dr. Frederic A. Gibbs of Boston.

Section on Dermatology and Syphilology: "False Positive Serologic Reactions for Syphilis Due to Smallpox Vaccinations (Vaccinia)" (Lantern Demonstration), by Drs. Francis W. Lynch, Saint Paul, and Anne C. Kimball and Ruth E. Boynton, Minneapolis. Paper, "Intraspinal Therapy of Neurosyphilis" by Drs. Robert R. Kierland and Paul A. O'Leary of Rochester. Also paper, "Verrucæ Planæ and Epithelial Nevi" by Dr. Morris Waisman of Chicago and Dr. Hamilton Montgomery of Rochester.

Section on Preventive and Industrial Medicine and Public Health: Dr. Harold S. Diehl of Minneapolis, a member of the executive committee. "Occupational Hazards of the Business Executive" by Dr. Edgar V. Allen of Rochester.

Section on Urology: Dr. Frederic E. B. Foley of Saint Paul, a member of the executive committee. Paper, "Bladder Difficulties in the Tabetic Patient with Special Reference to Surgical Treatment by Transurethral Resection" by Drs. John L. Emmett and J. B. Beare of Rochester. Dr. Foley of Saint Paul and Dr. Edward N. Cook of Rochester were also scheduled to open discussions on papers to be given in this section.

Section on Orthopedic Surgery: "Benign and Malignant Giant Cell Tumors: Diagnosis and Result of Treatment" by Dr. Henry W. Meyerding of Rochester.

Section on Gastro-Enterology and Proctology: Dr. J. A. Bargen of Rochester, section secretary. Paper by Drs. Charles W. Mayo and Edward Starr Judd, Jr., of Rochester on "Resection of the Right Colon for Nonspecific Ileocolitis." Paper, "Carcinomatous Gastric Ulcer Misleading Results of Medical Therapy" by Dr. George B. Eusterman of Rochester with Dr. John F. Weir of Rochester among those opening the discussion.

Section on Radiology: "Gallstone Obstruction: Pathogenesis and Roentgen Manifestations" (Lantern Demonstration) by Drs. Leo G. Rigler and Chauncey N. Borman, Minneapolis, and John F. Noble, Saint Paul. Paper, "Tumefactive Lesions of the Small Intestine" by Dr. C. Allen Good of Rochester. Also paper, "Results of Radium Treatment of Cancer of the Uterine Fundus with Special Reference to the Miscroscopic Grade of the Lesion" by Drs. Robert E. Fricke and Charles O. Heilman of Rochester.

Section on Anesthesiology: Dr. John S. Lundy of Rochester, section secretary. "The Men Who Discovered Anesthesia" by Dr. Walter C. Alvarez of Rochester. Paper, "Effect of Certain General Anesthetic Agents on the Small Vessels of the Rabbit's Ear" by Dr. Thomas H. Seldon of Rochester with Dr. Edgar V. Allen of Rochester participating in the discussion. Dr. Ralph T. Knight of Minneapolis, opening discussion on a paper by Drs. Clayton P. Wangeman and Malcolm H. Hawk of Madison, Wisconsin.

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Minnesotans represented in the scientific exhibit follow:

Dr. Vernon L. Hart of Minneapolis, special exhibit on fractures; Dr. Earl C. Elkins, Rochester, special exhibit on lame backs.

Exhibits on National Defense and War Medicine: Drs. Gordon B. New and John B. Erich of Rochester, "Treatment of Traumatic Injuries of the Face"; Drs. Samuel B. Harper and A. E. Osterberg, Rochester,



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"A Simple Method of Preparing Dried Blood Plasma and Its Clinical Use"; Drs. Walter M. Boothby, W. R. Lovelace, C. W. Mayo and A. H. Bulbulian, "Physiologic Problems in Aviation Medicine."

Section on Practice of Medicine: Drs. W. H. Dearing, A. R. Barnes, H. E. Essex and J. F. Herrick of Rochester, "Effects of Toxic Doses of Digitalis, Pitressin and Prolonged Oxygen Deprivation on Heart, Brain, Electrocardiogram and Coronary Blood Flow in the Experimental Animal"; Drs. T. J. Dry and F. A. Willius of Rochester, "Life Expectancy in Various Types of Conduction Disturbances Affecting the QRS Complex."

Section on Surgery, General and Abdominal: Drs. Waltman Walters, Howard K. Gray and James T. Priestley, Rochester, "Malignant Lesions of the Stomach; Importance of Early Treatment and End Results."

Section on Nervous and Mental Diseases: Dr. Lillian Cottrell, University of Minnesota, Minneapolis, "Histologic Variation in Nerve Trunks with Age and Chronic Debilitating Disease." Dr. F. P. Moersch of Rochester is the representative to this exhibit from the Section on Nervous and Mental Diseases.

Section on Anesthesiology: Drs. Thomas H. Seldon and John S. Lundy of Rochester, "Effect of Certain General Anesthetic Agents on the Small Vessels of the Rabbit's Ear."

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Among motion pictures shown were films prepared by Drs. Waltman Walters, Howard K. Gray and James T. Priestley of Rochester; Dr. Hamilton Montgomery; Dr. Paul A. O'Leary; Dr. Walter M. Boothby; Drs. Gordon B. New and John B. Erich; and Dr. James T. Priestley, all of Rochester. Dr. Frederic E. B. Foley of Saint Paul has also prepared two films.

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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

YOUR TEETH. Their Past, Present and Probable Future. Peter J. Brekhus, B.A., D.D.S. Professor of Oral Diagnosis, School of Dentistry, University of Minnesota. Foreword by Irvine McQuarrie, Ph.D., M.D., Professor and Head of the Department of Pediatrics, University of Minnesota. 255 pages. Illus. Price, $2.50, cloth. Minneapolis: University of Minnesota Press, 1941.

ORAL PATHOLOGY. A Histological, Roentgenological and Clinical Study of the Diseases of the Teeth, Jaws and Mouth. Kurt H. Thoma, D.M.D., Professor of Oral Surgery, and Charles A. Brackett, Professor of Oral Pathology, Harvard University. 1306 pages. Illus. Price, $15.00, cloth. St. Louis: C. V. Mosby Co., 1941.

FEEDING OUR OLD FASHIONED CHILDREN. A Background for Modern Mealtimes. C. Anderson Aldrich, M.D., Associate Professor of Pediatrics, Northwestern University Medical School; Chief of Staff, Children's Memorial Hospital, Chicago, and Mary M. Aldrich. 112 pages. Price, $1.58. Illus. New York: The Macmillan Company, 1941.

The authors have brought up to date in this, their entirely new manuscript, their book, "Cultivating the Child's Appetite," published in 1927. Its "personality build-up" is unique. The appetite problem is well depicted as more than a purely nutritional matter. The illustrations, so true to life, make the book very real.

LILLIAN L. NYE, M.D.

CARDIAC CLASSICS. Fredrick A. Wilius, M.D., M.S. in Med., Chief, Section of Cardiology, The Mayo Clinic; Professor of Medicine, The Mayo Foundation for Medical Education and Research, The Graduate School, The University of Minnesota, and Thomas E. Keyes, A.B., M.A., Reference Librarian, The Mayo Clinic; Formerly Carnegie Fellow, The Graduate School, The University of Chicago. 846 pages. 103 illustrations. Price $10.00. St. Louis: the C. V. Mosby Company, 1941.

The publishers state that they take pleasure in sending this book for review. Most certainly this reviewer takes pleasure in receiving it.

At the opening of the Pasteur Institute the great Louis Pasteur discussed two contrary laws which then opposed each other: "One a law of blood and death; the other a law of peace, labor and salvation." The 53 proponents of the latter law, whom Drs. Willius and Keys have chosen as forefathers of cardiology, are

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presented as though they were contemporaries, presenting epochal works of such caliber as to stimulate Abraham Lincoln's idealistic "Die when I may, I want it said of me by those who knew me best, that I always plucked a thistle and planted a flower where I thought a flower would grow."

It is patently impossible to review such a book as this otherwise than in generalities. The subject material is impeccable, otherwise it would not have survived to become classic. It therefore becomes a matter of reaction to the wisdom of the limitation of the list of contributors, choice and condensation of the works, and artistry of presentation.

For all three of these it would be difficult to imagine a more effective author-team source. There is the ability, facility, and the generally accepted conscientious simplicity and insistence on accuracy which insures the reader against the subjugation of truth by drama and romance. The careful reader will probably have his pleasure enhanced by the easy feeling that the authors have fully relieved him of any necessity for checking or questioning details. The more one knows Dr. Willius, the more this feeling will automatically exist.

It would be quite contradictory to derive the foregoing impressions without subconsciously feeling that the material was tastily presented. The cover is attractive, the paper and printing are excellent, and the binding should set an example for many a publisher. A brand-new book opens pliantly at any page and stays fully spread without page-bending tactics so often required.

In brief, this reviewer thoroughly approves of the volume and feels:

(a) that it lives up to its title as a classic,

(b) that it would be good for the soul of every physician regardless of his specialty,

(c) that it, or the equivalent of its contents, are essentials in the foundation of every internist in general and cardiologist in particular, and

(d) it would be fascinating and stimulating to any intelligent person regardless of profession.

R. L. Nelson, M.D.

ELECTROCARDIOGRAPHY IN PRACTICE. Ashton Graybiel, M.D., and Paul D. White, M.D., Harvard Medical School. 319 pages. Illus. Price $6.00. Philadelphia: W. B. Saunders Co., 1941.

This book pesents a very thorough analysis of electrocardiology. The basic principles of the electrocardiogram are considered and a complete review of normal electrocardiograms and variations of same is presented. It is of particular value in the presentation of electrocardiogram interpretations from the standpoint of different types of cardiac disease. Another valuable portion is the large number of electrocardiograms which are presented for interpretation. This book would be a valuable addition to the library of any internist or general practitioner who is concerned with the study of heart disease.

S. H. Boyer, Jr., M.D.

DIRECTORY OF MEDICAL SPECIALISTS

A second edition of the Directory of Medical Specialists has been authorized by the Advisory Board for Medical Specialties, to be ready for distribution in February, 1942, with its contents complete to January 1.

This Directory is the official publication of the Advisory Board, and will list the names of approximately 18,000 diplomates of the fifteen American Boards examining candidates for certification in the specialties. This is an increase of 4,000 over the first edition issued early in 1940.

The geographic grouping will give completely revised biographic data about each diplomate; there is an alphabetic index with addresses and specialty designanations; and the plan of organization, officers, and examination requirements of each American Board are fully outlined in their various sections.

The biographic data of diplomates will not only be revised to date, but also will include much new information not found in the first edition. Details of formal training is one of these, and military appointments now held is another.

Only those who have been formally certified by one of the American Boards can have their names included, and all of these are included, there being no charge or obligation other than certification for such listings.

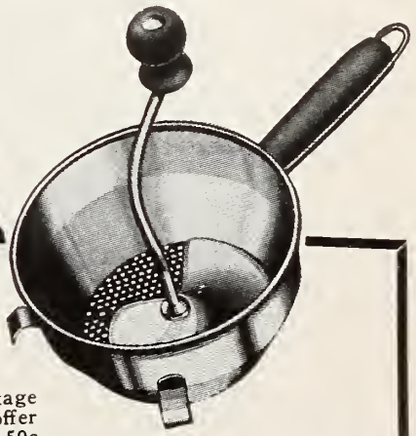
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The official nature of this Directory makes it invaluable as a reference book. It may be used generally for the referring of patients to distant communities; for the information of Medical Society officers; for gaining detailed knowledge about qualified specialists throughout the United States and Canada; for the obtaining of detailed information about the American Boards; and for many other purposes.

The first edition had a wide distribution not only throughout the medical profession as well as medical and other public libraries, but also among insurance companies and business firms dealing with physicians. Nevertheless, it is not a commercial undertaking as the Directory contains no advertising material, is underwritten by the Advisory Board and actually received subsidizing support so that it could be distributed as near to cost as possible.

Questionnaires for biographic data are now being mailed out with order forms. The Secretary of each Board urges that every diplomate return his questionnaire form as quickly as possible, and he is urged also to support this project of the American Boards by his subscription to the Directory. A substantially reduced rate is offered for prepublication orders, as the size of the printing is based largely on advance subscriptions.

The publication is issued through the Columbia University Press of New York. The Secretary of each American Board serves on the Advisory Editorial Board, and Paul Titus, M.D., 1015 Highland Building, Pittsburgh, Pennsylvania, of the American Board of Obstetrics and Gynecology, is the Directing Editor.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 24 JULY, 1941 No. 7

THE STATE ASSOCIATION*

B. J. BRANTON, M.D.
Willmar, Minnesota

THIS year will commemorate the four hundredth anniversary of the discovery of the Mississippi River by the Spanish Hernando De Soto in 1541. Can you imagine the astonishment and the amazement he must have expressed as he gazed upon the mighty stream that spread before him? He must have wondered where those turbulent waters came from. Little did he know that resting among lofty pines in the far north was a small lake as the source, or that the river which he discovered would have such a great share in the settling of this great north country. Could he have had visions of mighty steamboats plying these waters, carrying soldiers to subdue the aborigines, and settlers to form the nucleus of a future population of the finest type of American citizen?

Shortly after his discovery, we find the names of Hennepin, Duluth, Radisson, Le Sueur, Carver, Schoolcraft and many others, emblazoned on the history of our great Minnesota. They again had little thought as they explored the land and traded with the Indians that this Northwest territory would some day have a population of two and a half million people, to become noted for its lumber and milling industries, its iron mines and wheat fields, its dairy industry and vacation lands among the Sky Blue waters, its railroad systems and paved roads.

Little did Dr. Christopher Carli know that we would be celebrating today his coming in 1841 to the wilderness, distinguished as the first civilian physician to practice in this state. One hundred years have passed since then, filled with momentous events, wars and panics, depressions and inflations, an everlasting changing history of momentous world events, but truly a century of advance unparalled in history.

Turning the pages of medical history in the state, we find that eighty-eight years ago there gathered around a table a few medical men imbued with a spirit of mutual helpfulness who created out of their minds and meager financial resources, our state medical association, organized by them for the benefit, not of themselves alone, but for the people who they knew would need the best and only the best of medical care as the years came and passed. They left us a heritage which you and I should hold not only as a most dear birthright, but as an inspiration to promote still further that spirit of coöperation through which our association can ascend to greater heights. That friendly, brotherly, unified feeling engendering the Golden Rule which seems to have been lost sight of in many of our countries of the world today.

And then again, we must do homage to those men who through these years have builded great medical centers in the state, and the teachers in our state institutions of learning. We would not be twenty-six hundred or more strong in number on the roster of our association today if it had not been for their foresight and energy, their business sagacity and staunch citizenship.

This year I have followed a distinguished list of men who, as former presidents of the Association, for eighty-eight years have carried your torch of better health for all the people.

It has been my great pleasure, as your president, to become more intimately acquainted with the intricate workings of our Association. To anyone who doubts the importance of organization and organized medicine, a few days delving into the details and working of the association

*Presidential address at the annual meeting of the Minnesota State Medical Association, Saint Paul, Minnesota, May 27, 1941.

will soon have these doubts dissipated and find that the association, of which you and I are such an integral part, fills a place not only in the professional life of the state, but in the economic life of the people such as no other can.

Medicine is challenged by the people of this democracy to deliver at less cost better service to the populace, this service to be in great quantities available to all the people of every stratum of society, at any time. It is felt that we are selfish and obstinate in withholding this service and that we have a sinister motive in hiding behind the monopoly which the state has created by law in giving us the exclusive right and privilege to practice medicine.

I am glad to take up this challenge; it is easy to make clear that the medicine practiced today by our profession in the state of Minnesota and our United States is meeting every requirement made of it; that as practiced by us in Minnesota, it is economically sound and that the laws of the state with regard to who should have the right to practice the healing art are correct in continuing the patient-doctor relationship so dear to us who see only disaster to our people in state or socialized medicine.

To our beloved America, as well as to all the nations of the world, this is a time of confusion. Distrust is unrestrained among the nations and politically, economically, socially, as well as morally and intellectually, destructive forces are in motion. American democracy, a survival of one hundred and fifty years, is said to be a failure. Statesmen tell us the world is in a conflict of "the haves" and the "have nots." Misery and want are rampant over-seas. Starvation stalks those lands.

We must be concerned with the cure of this disease: "Dictator Self-Aggrandizement." What are the cures of this malady in this country?

It is fundamental that the most permanent economic system must be based on thrift and a reward to each individual in proportion to his energy outlay. Private business and industry will advance and afford a greater amount of employment, if they are permitted to function on safe economic principles with a fair wage for the worker and a fair profit for the employer.

The laws of nature control the physical well-being of the human body. Economic laws govern the surroundings of the body politic. The problem confronting civilized man everywhere is to recognize economic changes and adapt himself to them, to make these changes work to the benefit of his fellow men and not for the dissipation of world economy.

Democracy will last only so long as we who believe in it continue to sacrifice something of self to the common good.

The physician has always felt that he should remain in obscurity in politics. He has believed that his was a sort of an ethereal state around which sordid political strife should pass. I tell you it is time we exerted our efforts in political economy in our state and nation. We have education, we are citizens, voters, taxpayers and dispensers of a necessary commodity in our several localities. Let us use our power and exert our influence to the betterment of human society.

If we are responsible, as medical men, for the health of the people, as citizens we are likewise responsible in part for the social welfare of these same people.

The paternalistic system of the relief program has certainly had its demoralizing effect on the moral fiber of the people. The dispensing of relief on too wide and liberal a basis such as prevailed two or three years ago was wrong in mode of procedure and certainly on too liberal a basis. I believe in decentralization in all civil governments as a true democratic principal, subdividing of school systems and their control from the state University down to the little red school house on the hill; local civil government from federal government through state, county and township divisions; and that relief, as such, should be dispensed first by township officers, then by county boards, next by state officials and the national government called on as infrequently as possible.

Democracy was builded on the principle of the people, by the people, and for the people. This must prevail or the specter of dictatorship looms large on our horizon.

The art of medicine dates back to 500 B.C. Born of the mystery of superstition, it has evolved into one of the most learned, if not the most learned, of professions. A true physician has the same qualifications as any ideal man in his relationship to his fellow associates. He must have "more regard for the rights of others than for his own feelings, and for the feelings of others than for his own rights."

The road to success in medicine is a wary one. To be a true American physician, a man or woman must have an inborn native ability, a desire and inspiration to be of use to his fellow man, an aptitude to meet people, and a determination to overcome all obstacles after prolonged study, training and experience. He must be able to meet failure and success with equal fortitude, always safe in the knowledge that the majority of people have confidence in him and his profession.

But to measure up to this confidence, he must practice with integrity. He must be tolerant to other members of his profession; if a specialist, he must be especially learned in the particular part of medicine he practices. Specialists, as well as general practitioners, must be continuously educated. Postgraduate education in any vocation is a necessity in modern life. It creates satisfaction because of increased skill and experience and makes for a pleasing personality because of happiness in work better and more easily accomplished.

The medical profession is under close scrutiny today by the people of our country. They have been told that medical practice has deteriorated, that people are not being taken care of, even dying without medical care, in spite of the fact that we have in this country, the lowest death rate, infant and maternal mortality, and the lowest tuberculosis mortality of any country on the face of the globe. As a consequence, the population is growing older, the average American being two and a half years older than in 1930 and six years older than in 1900.

It is a fact that the so-called indigent have more sickness and disease than the more well-to-do. This has always been true, being an economic, not a medical problem.

It is said that the average American family spends approximately $60.00 a year for all types of medical and hospital care. This is a small amount when you know that two-thirds of the population are physically able to do hard work and dims into insignificance when we read that while the people of this country spend approximately four billion dollars a year for medical, hospital, nurses, drugs and dental care, that they spend for automobiles, gasoline and accessories, eight and a half billion dollars; for cigarettes and tobacco, two and a half billion dollars; for amusements, four billion dollars; for beauty shops and cosmetics, one billion dollars and for liquor, two billion dollars.

If this system of free enterprise which we enjoy in this country is ever lost to us, with it will go the enjoyed freedom of the press, freedom of speech, the right of assembly and of trial of jury.

The recent Americal Medical Association trial in Washington is of interest to all practitioners of medicine, both old and young; in fact, to all persons, members of professional or trade organizations. If held valid, all such organizations exist in violation of the antitrust laws and are subject to the same penalties.

Recently the National Physicians' Committee has been formed, a committee having for its two major aims:

1. To make possible the provision of medical service to the indigent and low-income groups, and to assure the most wide-spread distribution of the most effective methods and equipment in medicine and surgery.

2. To assume the responsibility of countering destructive propaganda by familiarizing the public with facts in connection with the methods and achievements of American medicine.

Because of the wording and scope of the constitution and by-laws of the American Medical Association, it is impossible for it, or its component associations, such as ours, to take an active part in such a program. Therefore, the National Physicians' Committee, having for its trustees and organizers men of known integrity, high in the councils of the American Medical Association, surely merits our every confidence. Individual initiative and free enterprise being one of the fundamentals of a democracy, we should in every way support the right of each individual in society to pursue without fear, the satisfaction of his happiness and his wants as he wishes. I can recommend to our membership a conscientious study of the aims of this committee.

I want to commend to the membership, the work of the Cancer Committee with the Women's Field Army, the new enterprise in Meeker County of the Tuberculosis Committee with the Public Health Association; the Committee on Indigent Problems and the Advisory Committee to the Social Security Department. The newly formed Ethics Committee and their coöperation

with the bar association is of prime importance in making future expert testimony before the courts more correct. The Committee on Child and Maternal Welfare, as well as the University Relationship Committee and their interest in University work and Continuation Center programs merit our support. The Radio Committee is getting good results in acquainting the public with medical problems. Our special thanks go to the Committee on Public Policy which has accomplished so much for us again this year. The members of this Committee have the well-merited admiration and confidence of the members of both houses in the legislature and our state officials at the Capitol.

It is with a deep sense of regret that I cannot mention each one of the committees of our Association. The chairman and members of each committee give so much of their time to us, give such conscientious concern to the matters presented to them, that it is no wonder to your officers that the work of the Association runs smoothly from year to year. Our appreciation to each one of them.

The Woman's Auxiliary of our Association does fill a great need by promoting interest in medical problems among the laity. They can be of a most definite use to our Association by laying out plans for the dissemination of medical knowledge through their contacts in various Women's Clubs, Parent-Teacher Associations, and similar lay groups. We need their support and help more at this time than in the past.

The State Hospital, Nursing, and Dental Associations are an integral part of the practice of medicine. Close harmony between us all is necessary to the carrying out of various programs of rehabilitation and the care of the sick. The problems of their associations are our problems. Much can be accomplished together; little if we are apart.

Hospital Service Associations such as we have in this state are highly to be commended and fill the need in that particular field. Prepaid medical service programs warrant careful and prolonged study before their adoption. To be successful, they must be state-wide and wholly under the guidance and control of medical men.

I would be dilatory if I did not mention the close harmony between the members of our association and the State Board of Health. This Department and its efficient staff have functioned one hundred per cent with us. This has, indeed, been a great source of pleasure to me personally, as it has to each one of you. It is very fortunate for the people of Minnesota that we have this close relationship.

Finally, unjust criticism of our profession by the public will be much lessened by three things: painstaking thorough work, a friendly tolerant attitude one to the other, and the assuming of a more understandable and common sense position towards all government departments, both state and national, whether military, civilian or welfare in character.

MEDICAL TESTIMONY*

ROYAL A. STONE
Associate Justice, Supreme Court of Minnesota
Saint Paul, Minnesota

DISCUSSION such as you want today should have at the outset its orientation, as correct and plain as may be. For this subject, that task is simple but highly important.

Courts are maintained for final and authoritative settlement of justiciable controversies, and the award and enforcement, if possible, of the appropriate remedy. In the process of decision, the first step is to ascertain truth; the next to apply law to the truth as judicially determined. It is with that first and highly important step of truthfinding that we are now concerned. Therein, the testimony of the qualified and honest expert, medical or otherwise, may be indispensable to the correct, judicial result.

The issues, the questions for determination, are first settled by what we call the pleadings. In sum, they are but affirmation and negation. The affirmative has the burden of proof, that

*Presented before the County Officers' Meeting, Saint Paul, Minnesota, February 22, 1941.

is, it must satisfy the fact-finder, jury, judge or commission, that it should prevail.

After issue joined by pleadings, comes the trial, at which the evidence, pro and con, is not only received but also tested by cross-examination and the argument of counsel. With the evidence of inanimate things, such as documents, we are not now concerned. Nor are we presently interested in the testimony of the ordinary witness which must go directly to the issue and ordinarily is confined to relevant facts within the orbit of his own observation and memory.

The present inquiry is confined not only to a special category of witnesses, but also to what we may term a subspecies of them. In many fields of inquiry courts resort to opinion evidence, sometimes even to that of laymen. But the larger part, and by far the most important, of opinion testimony comes from experts. They are so called, for convenience, because they are men of special, usually professional, training, experience and resultant skill in some field of endeavor and accomplishment not within the knowledge of the ordinary man.

The expert's opinion is received as an aid in or guide to judicial decision of questions of fact, the decision none the less judicial when made by a jury, which is an arm of the court. Received as an aid in the process of fact finding, the expert's opinion may be, and frequently is, controlling. So it is of prime importance, not only to the professions of medicine and law, but also to the whole public, which is damaged at a vital point in porportion as error and falsehood prevail over, or in any way obstruct, right and truth in the administration of justice.

At this point let me refer briefly to cross-examination. The ingenuity of man has devised no better way of testing the truth and honesty of spoken testimony—no more searching test of the soundness, both as basis and conclusion, of opinion evidence.

You need not repeat to me your complaints of the abuse of cross-examination by some lawyers. I know how well founded they are. Let me add at this point, as both diagnosis and prognosis, that the advocate who habitually abuses his right of cross-examination is on the way out.

The expert, if he deserves the name, is more than a match for the ordinary lawyer. I have seen more lawyers worsted by experts than I have the reverse. The sensible lawyer will treat any honest expert witness with deference. What is more, and this you may not realize, many a lawyer has lost his case by what is called "brow beating" of an adverse witness. A principal error of inexperienced lawyers is what our profession terms "too much" cross-examination. For the advocate, one experience of that kind is ordinarily enough. He has learned his lesson.

Another influence is at work. Recently, for most of the United States, the legal profession has brought about two reforms. It has increased "prelegal education" so that now two years of college work (in some states an academic degree) is required as condition precedent to the study of law. Then come the three or four years in law school. In addition, law examiners have elevated their standards in the same proportion. More than ever, candidates for admission to the bar are investigated as to their moral character. The result is that we, who sit as judges, now see a marked betterment, not only in the ethical standards of lawyers, but also in their professional technique. Excessive and improper cross-examination of witnesses is therefore on the wane, because, when it is not unethical, it is foolish.

During my eighteen years on the court of last resort of Minnesota we have disbarred nearly 100 lawyers. The beneficial result for the rest of the profession, and for those with whom it deals as witnesses and otherwise, is apparent. A significant thing about these disciplinary cases is that, so far as I now recollect, not one of the unfortunate attorneys had the benefit of a college education. The legal profession, like that of medicine, insists upon having as much as practicable of education, not alone for its result in knowledge and skill, but also for its manifest contribution to the building of real character.

If my knowledge of the attitude of doctors toward courts and lawyers is correct, your next bone of contention with us is the hypothetical question. Here again, I know generally what your criticism is, and I admit freely that it has much basis in fact. In the law an effort is being made not so much to do away with the hypothetical question as to prevent its abuse. For instance, the proposal has been made, and in some cases it has been tried, of requiring all hypothetical questions to be submitted in writing to opposing counsel and the court, before being propounded to the witness.

I do not like that idea. It would have too much of a tendency to delay the trial. Moreover, cross-examination of an evasive or untruthful witness is frequently unsuccessful if it is too slow. All trial lawyers know the danger of giving such a witness too much time in which to consider what his answer should be, in order, not to tell the truth, but deliberately to falsify.

In my judgment, the evils of the hypothetical question, and I confess their presence, may be removed by the entirely adequate control which the trial judge has of the conduct of a trial. It is his duty to keep counsel within their proper limits and protect witnesses, whether expert or nonexpert.

Both as to cross-examination and hypothetical questions, the expert is not at the mercy of an unscrupulous advocate. He has a perfect right to insist, and state his reasons for doing so, either that a question is improper or futile, or that the hypothetical question, from the scientific standpoint, is wholly beside the mark and not susceptible of intelligent answer.

Let the expert remember that he is being examined in his own special field; let him remember that by becoming a witness he has not lost the right of reasonable self-assertion, and that he, rather than the lawyer, should be the author of his testimony; let him remember that he is being asked for his own opinions, and therefore has a right to assert them, as such, without too much attempted dictation from counsel, and he will have solved many of the difficulties which otherwise may confront him on the witness stand.

In short, stand on your own professional and personal rights. Do not submit to unfair treatment by advocates. If you are too much badgered by such things as demands for "yes" or "no," when both are either impossible or misleading, it will be due to your own lack of proper self-assertion.

Effort has been made to do away with abuses of the hypothetical question. It has gained some headway. Expert opinion is after all opinion. The court's duty is to find the facts. So it must know the factual basis for all opinion testimony, especially where, as is too often the case, opinions of experts are irreconcilably opposed.

It frequently happens that an opinion of a perfectly honest and highly skilled expert is based on error of fact for which he may or may not be responsible. Where the cross-examiner is prepared later in the trial to show such error, it is entirely proper to ask for the opinion of the witness on the postulate that the fact is other than he has taken it to be.

You may be interested in knowing that the National Conference of Commissioners on Uniform State Laws (the Conference is somewhat of a subsidiary of the American Bar Association but its members in most of the states enjoy a quasi-official status) in 1937 adopted and recommended to the state legislatures a "Uniform Expert Testimony Act." Time does not permit an examination in detail of its plan. Here is the gist of it as stated by its authors:

> "This Act authorizes the court to select and summon expert witnesses; it provides for conferences and joint reports of these witnesses, for their personal examination of the subject-matter of the controversy, and for the removal of the objectionable features of the hypothetical question."

When and if the Minnesota Medical Association desires to have some such plan recommended for adoption by the Legislature, you will find the State Bar Association ready to coöperate. The Bar alone, as things stand now, might sponsor, but it could not insure success for, such an effort at reform.

There is another feature which cannot be too much stressed. It is one in which I fear medical witnesses have been much at fault. But the fault is probably as much due to the ineptitude of lawyers as to any conscious error by doctors.

Decisions are made not alone on direct evidence—they are reached in most cases by what logic calls the process of inference or deduction from known facts. They should never be made by that very different and inferior mental process of guess or conjecture. Therefore, the expert's opinion should be strictly, studiously, conscientiously confined to what he can say on oath is his logical inference or deduction, rather than his mere speculation or conjecture. His opinion, in order to be confined to its proper function as aid or control of decision, must be cofined to what he can say is sure or reasonably probable, rather than to what is only speculative or possible. Of course, if he is asked to speculate, or deal in mere possibility, he may do so.

An extreme example of fanciful theory as substitute for logical inference is the case of the witches (6 How St. Tr. 647, 698) tried in 1665.

There a physician, in substance, testified that, in his opinion, the accused were witches, because, forsooth, the fits to which they were subject permitted no other diagnosis.

So far as I know, no profession has a more accurate and scientifically satisfactory terminology than that of medicine. I have long envied you its possession and use. We of the law can boast no such accomplishment. Our terminology is unavoidably unscientific and loose. One of the objectives of the American Law Institute has been to better that situation so far as possible.

But the excellence, for its purpose, of your terminology does not justify the use you make of it on the witness stand. Too many of you fail to remember that you are not talking to your own professional associates, but that, instead, you are speaking to laymen, who understand few, if any, of your scientific, medical terms. If, therefore, your testimony is left in the terminology of your profession, without a translation which the layman can understand, your whole effort as a witness will be confusing if not futile.

Here is an illustration of an admirable piece of work by one of your profession, taken from a recent record before the Supreme Court: The doctor was asked for his diagnosis. His reply was, "A family ataxia in all probabilities of the Fredreich's type." He immediately explained, "Ataxia means uncertainty in one's gait or uncertainty in one's equilibrium, lack of balance."

If the medical expert, wherever possible, will confine himself to language which the layman can understand, or if he must use his own scientific terminology, if he will immediately make the best translation of it he can for judge and jury, he will be bettering the status of the medical expert witness and enhancing greatly the value of his testimony.

By way of general observation, may I respectfully suggest, for the attending or examining physician who may become a witness, the need for complete and accurate case records. The witness with a contemporaneous record to help his memory may speak with a cogency that would be lacking in the absence of any history or if it were incomplete.

Personally, I have been somewhat surprised by the extent to which doctors leave the making of hospital records to nurses. Thereby it seems to me the history is too much opened to error, especially of omission. As evidence, the chart will have probative value largely in proportion as it speaks for doctor rather than nurse. The suggestion is not that you should do the writing but only that, as a matter of self-interest, the record is important to you. It is apt to be highly so if fate ever unfairly casts you for the part of defendant in a malpractice suit.

Now for a feature which more or less characterizes all expert testimony. Concerning it a former chief justice of the United States once said: "My own experience, both in the local courts and in the Supreme court of the United States, is that, whenever the matter in contest involves an immense sum in value, and where the question turns mainly upon the opinion of experts, there is no difficulty in introducing any amount of them on either side."

We of bench and bar recognize the large area of medical consideration and inquiry in which there is room for reasonable difference of opinion. We would not be frank with you, however, if we did not say, unequivocally, that cases are all too frequently being presented to the courts wherein medical experts disagree concerning a matter as to which, in our technically uninformed opinion, they should be in agreement. In other words, we feel and cannot be blamed for doing so, that on one side there is either wilfully false testimony, or the opinion is that of an incompetent witness.

This is a pathological condition of medical jurisprudence for which bench and bar have no efficient therapy. We can't even make a diagnosis, to say nothing of prescribing. Remedies we have in the penalties for perjury and its subordination. But they are difficult of application at the best—impossible of it without your interested, systematic and active coöperation.

When doctors disagree as witnesses we know usually that both views are sincere—that there is room for reasonable difference of opinion. But, in some cases, we suspect that on the one side or the other there is wilful untruth or just plain incompetency. Here is an actual case. Two, if not three specially qualified and experienced roentgenologists, testify that a plate in evidence shows no skull fracture. One general practitioner, one only, with no training and slight experience in their specialty, opposes them. He says there is plain evidence of fracture. The jury

believes him, rejecting the only testimony which probably all of you would consider competent.

This is the sort of thing that explains such comment as this, coming not from a lawyer but from one of your own profession: "At present expert medical testimony is in a deplorable state."*

No judge is qualified even to investigate such a situation. However much he might investigate, he would yet lack the personal qualifications requisite for correct decision. The problem is one susceptible of competent investigation and decision only by doctors. Furthermore, the remedy, wholly adequate, is in their hands. Where deserved by the incompetent or untruthful medical witness, a professional disciplinary proceeding cannot be bettered as both punishment for the offender and deterrent for others.

The bench and bar of Minnesota are grateful to the Minnesota State Medical Association for being, so far as we know, the first to take constructive steps in devising a needed therapy for this recognized evil. You have set up a standing committee to which any judge may refer the record of any medical testimony which he, rightly or wrongly, suspects of being the result of incompetence or falsehood. But, there again, it is respectfully submitted, the initiative must not be left to lawyer or judge. Unless doctors take over the whole matter the effort will be futile. That is because lawyer and judge will be slow to the point of timidity in even suggesting that the testimony of a doctor should be subjected to investigation by his own colleagues.

The doctor called as a witness becomes, pro tempore, a medical jurisconsult. That function should rule out all bias and tendency to partisanship. The task of freeing medical testimony from all such improper factors and influence is yours.

If, on the witness stand, a doctor violates the standards of his own profession, some other doctor is sure to know of it. On the latter, rests the initial responsibility for activating the professional attention deserved by the misconduct. In proportion as that responsibility is not promptly met and properly discharged, the fault will be that of doctors rather than lawyers.

†Jour. A.M.A., 116:209, 1941.

You, of the Minnesota State Medical Association, have the credit of being the first to meet the issue professionally, constructively and practically. The eyes of the whole American Bar, and particularly of all state judicial councils, soon will be, if they are not now, watching your experiment. You are in sole charge of it. We mere lawyers must simply stand by ready to render such aid as may be possible.

This is an appropriate point at which to remind you that our state and local bar associations have their ethics committees. If any of you have a complaint against any lawyer they will hear it and take the appropriate action, which will be disciplinary if the facts so require.

Honored as any lawyer would be by your favor on such an occasion as this, I must guard against possible thought that I came here to speak in criticism or disparagement. What has been said has been uttered in conscientious response to what I considered your desire. To the extent that my language approaches that of criticism, it has to do with an evil which you formally recognize and concerning which you have as formally determined to do something.

For the accomplishments of doctors of medicine, for their integration and loyalty to high ideals, we of bench and bar have the highest admiration. "Many a time and oft," it is expressed in terms of unfeigned envy. In my own person, there is the debt, thrice repeated. of life itself. Had it not been for the devotion and skill of certain members of your profession, you would not now be required, by the error of your program committee and your own courtesy, even to appear to be listening to me, respectfully or even wakefully. If it has been an ordeal, take it out on them.

But let me warn you—one of them was a frontier family physician of the "horse and buggy" days long since gone to his reward.* So fine a character was he professionally and personally, so saintly was his whole life, that in the hereafter, if it be justly departmentalized in respect to reward and punishment, some of us may find it impossible to locate him.

*Inquiry has developed that the subject of this tribute was the late Dr. H. L. Hubbard, a pioneer physician of Morris, Minn.

RELATIONSHIP OF THE VOLUNTARY HOSPITAL SERVICE PLANS TO MEDICAL PRACTICE*

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IN the beginning . . . the medical profession looked upon the infant Hospital Service Plan with a rather skeptical eye. . . .

Which reminds one of the story of the ambitious young lady who yearned to forsake the abode of her childhood and venture forth to claim her rightful place in the affairs of the world. Her parents remonstrated profusely, but to no avail. Then as a final stroke the father informed his determined daughter that she need not darken the door of her home again. . . . Time marched on, and in less than ten years the daughter had become a famous actress, and the proud parents "basked in reflected glory"—completely forgetting their violent opposition to her ambition.

Today, an attitude of interest and coöperation prevails on the part of the medical profession. In confirmation, your attention is called to the fact that on December 15, 1940, the Minnesota State Medical Association formally approved the Minnesota Plan after seven and one-half years of successful operation. Further recognition was evident by the physicians' sponsorship of the Regulatory Act recently enacted by the Minnesota State Legislature—all of which indicates that skepticism has given way to a recognition of the physician's rightful place in such a community health program. It is believed that the fine relationship between the medical profession and the Voluntary Hospital Service Plans which has been established in this state, will eventually develop throughout the country.

The rôle of the practicing physician in the Voluntary Hospital Service program is one of primary importance. In fact, he might be considered the "man at the controls" between the subscriber as the recipient, and the Plan as the distributor of benefits through the hospital. Therefore, it is obvious that a thorough knowledge and understanding of the Plan on the part of the physician is necessary if it is to operate successfully and maintain the benefits for the subscriber. On the one hand, each subscriber has a right to expect the fulfillment of the provisions of the contract that he has purchased; while on the other, the Plan must be protected from an abuse of its benefits offered in good faith.

The physician, the hospital and the Plan, operate as an interdependent unit; in the hands of the physician rests the responsibility for hospitalization of the patient; the hospital is expected to render the necessary services required by the patient; and the Hospital Service Plan reimburses the hospital for the cost of this service as guaranteed by the subscriber's contract. Thus it can be realized how important it is for these three to operate harmoniously for the good of the whole.

Maximum subscriber benefits from Voluntary Hospital Service Plans can be realized only when this inter-relationship is founded upon mutual confidence, understanding and coöperation; and such a relationship is not only desirable, but paramount for the continued existence and expansion of the Plans.

Voluntary Hospital Service Plan policies should be based upon the needs, desires and facilities of the particular community which they serve. The medical profession is a valuable source for obtaining this necessary information, and should have representation on the policy-making or governing body of the organization. Their professional experience and knowledge of local community conditions can be utilized effectively in formulating mutually satisfactory policies.

This active participation of physicians in the community opens the way to efficient and cooperative action, for as the physician's understanding of the Plan and its workings increases, he can better explain its benefits to his patients. This is of primary importance to the Plan, for this professional approach insures good will through the satisfactory adjustment of differences of opinion, which might otherwise develop into controversies.

The establishment of a Medical Relations, or Medical Advisory Committee can be of additional

*Presented at the Sectional Meeting of the American College of Surgeons, Minneapolis, March 10, 11, 12, 1941.

value to the Voluntary Hospital Service Plan. The exercising of the right of arbitration by such a committee is desirable in settling differences of opinion and claims that might arise among the subscriber, the Plan, the hospital and the physician—and particularly those problems related to medical matters. Some Plans maintain a medical department for this purpose.

Under the Voluntary Hospital Service Plan the physician's prerogatives are not disturbed in that he has complete freedom in the treatment of the patient; likewise, the patient has a free choice of physician. The Plans have always zealously and effectively guarded this freedom.

At this point it might be well to mention a few of the advantages enjoyed by the physicians as a result of this Voluntary Hospital Service program. It has been responsible for retaining as private patients for the physician, a large group of people who were previously medically indigent. Further, it has alleviated a great deal of the difficulty formerly experienced with the patient who needs hospitalization, but who could not assume the expense involved. Thus a large number of subscribers of the low income group, who would be deprived of adequate care in numerous instances, or be obliged to become indigent patients in charity hospitals, are provided the opportunity to remain self-supporting in this respect. It should not be overlooked that such a situation has a definitely elevating effect on the general morale of a community, and it is my contention that the majority of people are desirous of paying their own way—thereby exercising freedom in the choice of a physician and a hospital.

Further, it is believed that with such a program, whereby a large number of people are given an opportunity to systematically save for hospital care on a community basis, the threat of compulsory health insurance, with all its hazards and bewildering administrative complexities, all its bureaucratic defects and its inevitable excessive costs, can be indefinitely postponed.

In reciprocation of the Plan's endeavor to protect the rights of the physician, and make it possible for him to receive these advantages, the Plans expect the physician to assume the responsibility that is rightfully his—that is, to protect the Plans from abuse of its benefits. A few of the ways in which this protection may be exercised are as follows:

1. To hospitalize a subscriber only when the condition warrants.
2. To hospitalize a subscriber only for the number of days necessary.
3. To avoid hospitalization for rest, prolonged convalescence, et cetera.

A few rather presumptuous examples of the exploitation of these services offered in good faith might be cited as follows:

1. Patient "X" being hospitalized nine days for a fracture of the distal phalanx of the second toe.
2. Doctor "X" hospitalizing all obstetrical patients fourteen days when the average for non-subscribers is ten days.
3. Subscribers hospitalized from three to four days for tonsillectomies, when the average for non-subscribers is from one to two days.
4. Before the inauguration of the Voluntary Hospital Service Plan the average stay for appendectomies was ten days; afterwards, eleven days.

The citation of experience of the Minnesota Hospital Service Plan for the year 1940 will clearly indicate the extent of the physician's responsibility. During the year 1940 the Minnesota Plan paid hospitals $1,308,380, for 42,534 subscribers, who were hospitalized for 302,492 days. If these 42,534 subscribers had been hospitalized for one more day, the additional cost to the Plan would have been about $180,000, which means that the reserves for 1940 would have been wiped out, leaving a deficit of approximately $50,000. The inevitable result would be that either the rates to the subscriber would have to be increased, or the benefits decreased—thus defeating the primary purpose for which the Plan was originally organized.

This experience clearly indicates the great importance of the rôle of the practicing physician in this Voluntary Hospital Service movement. The physician who fully appreciates and accepts this responsibility, contributes a great service to the success of this health program by exercising his controlling influence to discourage the tendency of some subscribers to take advantage, unnecessarily, of the Plan's benefits.

Briefly, the solution of this serious problem which confronts the Voluntary Hospital Service Plan, lies in the development of a mutual un-

derstanding among Plan executives, physicians, the public, and hospital administrators—particularly for physicians and the public. Such an educational program may be conducted through the medium of letters, bulletins, booklets, personal discussions and group meetings. A reference manual clearly describing the provisions of the subscriber's contract, is a valuable guide to the physician. This manual should be brief, interesting, and to the point—thus encouraging reading.

Because of the direct benefits to the hospital, it may appear inconsistent for a hospital administrator to be advocating a decrease in hospital utilization. However, in order to protect the benefits to the subscriber, we as hospital people must take a less selfish attitude, and think in terms of the greatest good we can do for the greatest number of people.

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MENINGIOMAS OF THE SPINAL CORD*

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SPINAL cord tumors are relatively favorable lesions for surgical treatment. They produce a train of symptoms and signs which, together with various laboratory aids at our disposal, permit their diagnosis and localization with a high degree of accuracy. More important, however, is the fact that most spinal cord tumors are solitary, benign lesions which lend themselves to surgical extirpation.

Benign tumors of the spinal cord are made up largely of two histologic types, *meningiomas,* which arise from the spinal meninges and lie intradurally, and *neurofibromas,* which arise from the sheaths of the spinal nerves and may be intradural, extradural or both. Together they comprise over one-half of all intraspinal neoplasms. In most of the reported series of cases the meningiomas have outnumbered the neurofibromas but in the series of 557 cases studied by Rasmussen, Kernohan and Adson the neurofibromas comprised 29 per cent of the entire series while the meningiomas accounted for 25 per cent. During the past year I have operated upon nine patients with intraspinal neoplasms, of whom four proved to have meningiomas.

The literature contains few communications devoted specifically to meningiomas of the spinal cord. The paper of Learmonth and the monograph of Cushing and Eisenhardt are the most comprehensive of the available reports.

Pathology

The term meningioma was proposed by Cushing to designate tumors taking their origin from the cranial and spinal meninges. These tumors are presumed to develop from embryonic rests of meningoblastic cells which are seen most frequently in the vicinity of the arachnoid villi but which occur elsewhere in the leptomeninges and in the dura. Conflicting views regarding the histogenesis of the meninges and the tissue structure of these tumors have led to their being known by many names, among them dural sarcoma, fibroma, endothelioma, meningeal fibroblastoma, and neuro-epithelioma. Until these arguments have been finally resolved, Cushing's term is preferable since it is at once simple, descriptive and noncommittal on debated points.

Intraspinal meningiomas are similar in both gross and microscopic structure to those occurring intracranially. The typical intraspinal meningioma is a discrete, encapsulated tumor having a roughly spherical or ovoid shape. It may arise from the leptomeninges but usually has an attachment to the inner surface of the dura. This area of dural attachment tends to be small in relation to the size of the tumor and to be in the vicinity of a nerve root, a site where there are found structures quite analogous to the

*From the Division of Neurosurgery, Department of Surgery, University of Minnesota Medical School and the University Hospitals. Presented before the Minnesota Society of Neurology and Psychiatry, December 9, 1940.

arachnoid villi and cell rests of the cranial meninges. The blood supply of the tumor commonly enters through the dural attachment. More rarely intraspinal meningiomas assume a broad, flat shape with an extensive area of dural attachment. Meningiomas displace and compress the spinal cord and its nerve roots, often to a remarkable degree, but do not invade them. The tumors are soft or firm in consistency and may contain loculations of yellow fluid. A deposit of calcium is common in these tumors, particularly in those of long standing. Spinal meningiomas only seldom penetrate the dura and apparently never arise extradurally. They differ from intracranial meningiomas in that they never involve the bone with the production of hyperostoses.

Although the gross appearance of intraspinal meningiomas is not unlike that of neurofibromas, they may be readily distinguished by the fact that the latter arise within a spinal nerve or nerve root, whereas the meningiomas may displace the spinal nerve roots but do not invade them.

Histologically meningiomas present a variety of forms. They may be predominantly cellular, with or without whorl formation, fibroblastic, osteoblastic or angioblastic. Detailed classifications have been proposed by Bailey and Bucy, Globus, and Cushing and Eisenhardt. Most meningiomas are slowly growing and benign, and if completely removed do not recur. Certain forms, however, particularly those of a mesenchymal or angioblastic nature, grow rapidly and may recur soon after seemingly complete removal.

Some authors have broadened the concept of meningioma to include all tumors of the central nervous system whose cell type forms a constituent of the normal meninges. This inclusion of sarcomas, melanomas and lipomas among the meningiomas may be defensible on pathologic grounds but is confusing if carried over into clinical discussions.

Clinical Features

Intraspinal meningiomas occur more commonly in women, the proportion varying from 66 per cent to over 80 per cent in reported series of cases. They are predominantly a tumor of adult life, 90 per cent of Learmonth's patients being over thirty years old, and 80 per cent of Elsberg's over forty. Among Ford's series of twenty-one cases of intraspinal tumor in children only one was a meningioma.

Meningiomas occur at all levels of the spinal cord but are rarely found in the region of the cauda equina, a circumstance for which there is no ready explanation. In terms of the vertebral column the distribution of meningiomas in Rasmussen's series was: cervical spine, 16.5 per cent; thoracic spine, 82 per cent; lumbar spine, 1.5 per cent.

The majority of meningiomas of the spinal cord produce symptoms for one to two years before being diagnosed and removed, but considerably longer histories are by no means unusual. The symptoms may be gradual or dramatic in their onset, but once present tend to progress unrelentingly. The symptoms, and their concomitant neurologic signs, are in no sense specific for meningiomas but are those common to all spinal cord tumors. They consist in brief of two elements, either of which may predominate but both of which are usually present.

1. Pain due to irritation of nerve roots by the tumor. This radicular or root pain is characteristically initiated or aggravated by actions which raise the pressure in the spinal epidural space (coughing, sneezing, straining) and jarring. The pain often comes on during recumbency and may be relieved by resumption of the erect posture.

2. Sensory, motor and sphincter paralysis resulting from compression of the spinal cord by the tumor. This, if unchecked, progresses finally to the point of complete paraplegia. Either motor or sensory symptoms may be the first to appear and either may dominate the clinical picture. A variety of syndromes may be produced including some which closely simulate systemic and degenerative disorders of the spinal cord, such as primary lateral sclerosis, subacute combined degeneration and multiple sclerosis.

By the time a lumbar puncture is performed, in most cases manometric studies will demonstrate a complete block of the spinal subarachnoid space (positive Queckenstedt test) and the fluid obtained will contain a moderately increased quantity of protein, often being xanthochromic.

By contrast, neurofibromas of the spinal cord typically occur in men, and have no predilection for any age group. They tend to have produced symptoms for less than one year or more than two. The neurologic examination usually indi-

cates a lesion in the cervical or lumbar regions of the spine. Their first symptom is usually unilateral root pain or other sensory disturbance of segmental distribution. A block of the spinal subarachnoid space is present and the fluid obtained by lumbar puncture contains a considerably increased quantity of protein (more than 250 mgm. per 100 c.c.).

Equally as important as the diagnosis of the presence of a spinal cord tumor is its exact localization. The level of sensory loss which may be determined by neurologic examination is a treacherous guide to the site of the tumor and should not be relied upon as the sole localizing sign. It not infrequently is several or many segments below the level of the lesion, and in any event it indicates the spinal cord level, which does not correspond to the vertebral level except in the upper cervical region. The sensory level has been noted to rise perceptibly after performance of a spinal puncture which presumably allowed the tumor to shift its position and wedge itself more tightly into the vertebral canal.

Radiographic study of the spine has less diagnostic and localizing value for meningiomas than for many other sorts of spinal cord tumor. Whereas 30 per cent of all spinal cord tumors will produce some bony changes, only 10 per cent of meningiomas do so, as compared with 45 per cent of neurofibromas. The changes most commonly seen are erosion of the vertebral pedicles and widening of the vertebral canal at the level of the tumor. Occasionally the meningioma itself may be visualized by virtue of the calcium deposited in it, as was the case in two of forty-three cases studied by Camp.

Accurate localization of most meningiomas will require some form of radiographic visualization of the spinal subarachnoid space (myelography). The most familiar method of doing this is by the introduction of radiopaque substance (lipiodol) into the spinal subarachnoid space with subsequent fluoroscopic and radiographic observation. Such a study not only locates the meningioma but usually will indicate its intradural and extramedullary character as well.

In the event that the tumor is completely obstructing the spinal subarachnoid space a simpler expedient is available in the form of air myelography. A quantity of the cerebrospinal fluid below the level of the tumor is removed and replaced with air. The patient is then placed in the upright position and x-rays of the spine are made. These will show the air trapped in the spinal subarachnoid space just below the tumor, outlining its lower border.

Report of Cases

Some of the clinical syndromes which may be produced by intraspinal meningiomas are illustrated by the following case reports. For the sake of brevity and clarity only these historical facts and laboratory data which were pertinent to the diagnosis of the spinal cord tumor will be recorded here; in each instance a complete study, both medical and neurological, was carried out. The pathological studies in each case were made by Dr. A. B. Baker, of the Division of Nervous and Mental Diseases.

Case 1.—A fifty-six-year-old woman had complained for two years of sharp stabbing pains in her lower back and along the lateral aspects of both thighs. The attacks of pain were brought on by coughing, sneezing, and stooping over. She was forced to sleep in a semi-reclining posture because of the severe pains which came on if she lay flat in bed. For several months both lower extremities had been subjectively numb and during the month preceding admission her legs had become so weak that she was no longer able to stand or walk.

The patient weighed 250 pounds and had a mild arterial hypertension. The abdominal reflexes were absent, as were the deep reflexes in both lower extremities. The Babinski reactions were bilaterally positive. An area of cutaneous hypo-esthesia was present involving the "saddle area" on the right and the distal two thirds of the right lower extremity; the corresponding areas on the left seemed by comparison hypersensitive.

No evidence of tumor was seen in x-rays of the spine. A complete block of the spinal subarachnoid space was found upon lumbar puncture. The cerebrospinal fluid was clear but contained an increased quantity of protein (170 mgm. per cent). Subsequent air myelography outlined the lower border of the tumor at the level of the eleventh thoracic vertebral body.

The removal of two pair of vertebral laminæ sufficed to expose the tumor, which was attached to the left anterolateral aspect of the dura, displacing the spinal cord posteriorly and to the right. It was soft and friable, defeating any attempt to roll it out from beneath the cord. The greater part of the tumor was therefore removed by suction, following which the base of the tumor and the area of dura to which it was attached were removed. The tumor was of a cellular type with whorl formation (psammoma).

The patient was about to be dismissed from the hospital in the third postoperative week when she devel-

oped a bilateral bronchopneumonia wtih pleural effusion. These were treated with sulfathiazol, oxygen and repeated thoracenteses. She was finally dismissed two months after operation, at which time the deep reflexes and some motor power had returned to her lower extremities.

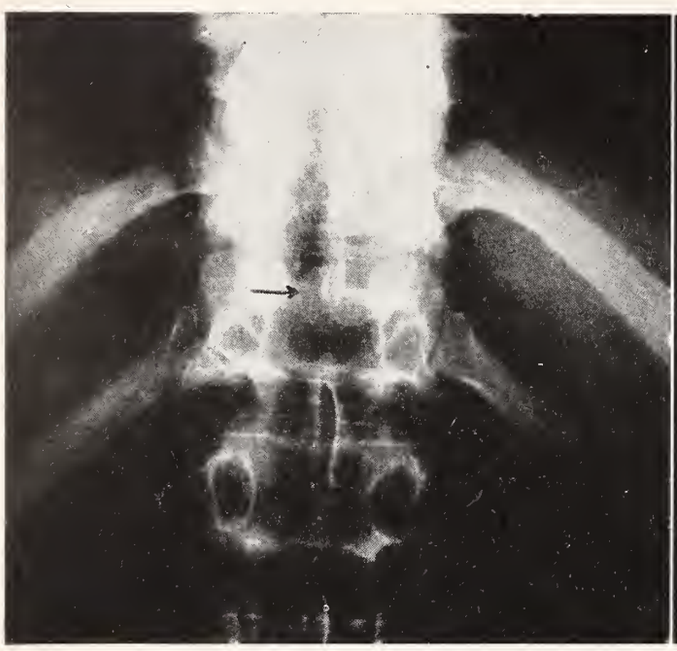


Fig. 1. Case 2. Air myelogram outlining meningioma of spinal cord.

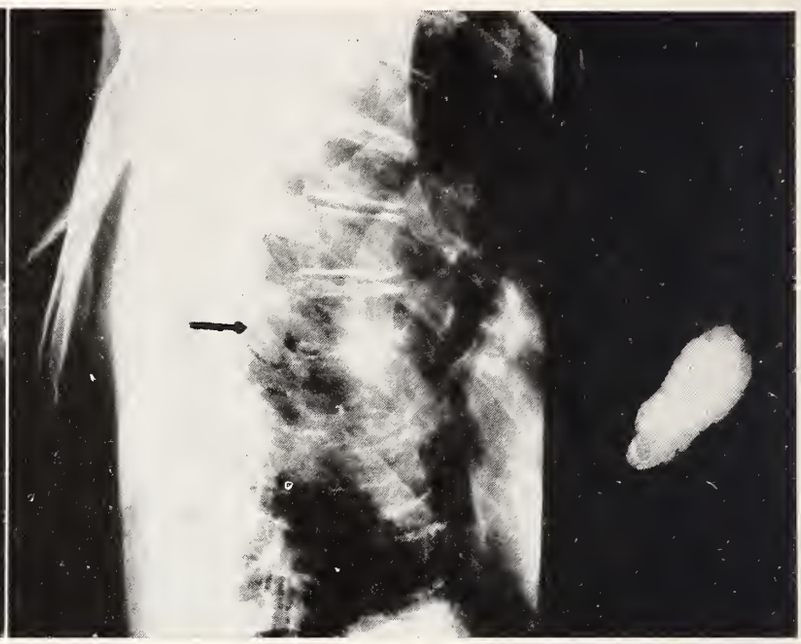


Fig. 2. Case 3. Radiogram of thoracic spine, showing calcified meningioma within vertebral canal. On right, a radiogram of the tumor after its removal.

Case 2.—A thirty-five-year-old farmer had for two years noted numbness of his lower extremities, beginning in the feet and gradually ascending to the hips. During the past year his lower extremities had become so weak that he required support in order to get about. Although pain was a minor complaint there had been some low back pain which upon coughing or jarring would radiate about his trunk in girdle fashion, just below the level of the umbilicus. Bladder and rectal sensation were lost.

The deep reflexes were hyperactive in both lower extremities and the Babinski reactions were positive. The right calf muscles were moderately atrophied and some fibrillary twitchings were noted in the left thigh muscles. Position and vibratory sense were completely absent in both lower extremities and all forms of superficial sensation were reduced in the saddle area and in the distal portions of the lower extremities.

Lumbar puncture disclosed a complete block of the spinal subarachnoid space; the cerebrospinal fluid obtained was yellow and contained 170 mgm. per cent of protein and one cell per cubic mm. On x-rays of the spine a questionable erosion of the pedicles of the twelfth thoracic vertebra was noted. This finding was confirmed by air myelography which demonstrated a circumscribed intradural mass whose lower border lay opposite the lower border of the twelfth thoracic vertebra (Fig. 1).

Removal of the spines and laminæ of the eleventh and twelfth thoracic vertebræ permitted the removal, in one piece, of a meningioma which was attached to the anterolateral portion of the dura and had displaced the cord posteriorly and to the right. The tumor weighed five grams and was of meningotheliomatous type.

The patient was discharged from the hospital on the fourteenth postoperative day, at which time he had regained much of the lost motor and sensory function of his lower extremities.

Comment.—These two cases are examples of typical meningiomas of the spinal cord, if one may speak of such a thing. The two tumors were strikingly similar in level and location, yet one patient had complained chiefly of pain until shortly before her admission, while to the other patient pain had been a minor complaint. The pain in each instance, however, was characteristic of that produced by spinal cord tumors. The first patient had been unable to sleep lying flat in bed because of the severe root pains which came on several hours after lying down. The occurrence of such pain, and its relief by resuming the erect position, is perhaps the most characteristic single symptom of spinal cord tumors.

Case 3.—Seven years before coming to the hospital this sixty-four-year-old woman had noted the gradual onset of unsteadiness in gait and a tendency to fall, especially while walking on rough surfaces. Finally

she was unable to walk unless she watched her feet. During the year prior to admission bladder incontinence and obstipation had appeared. At no time did she complain of pain.

The abdominal reflexes were absent and the deep reflexes were hyperactive in both lower extremities, the Babinski reaction being positive bilaterally. Posterior column function, as measured by position and vibratory sense, was practically absent in the lower extremities and it was the resulting incoördination rather than actual weakness, which rendered the patient's lower extremities virtually useless. Superficial sensation was reduced below a level corresponding to the twelfth thoracic dermatome.

Upon lumbar puncture the Queckenstedt test showed an incomplete block of the spinal subarachnoid space. Bilateral jugular compression caused the cerebrospinal fluid pressure to rise from 4 to 20 mm. of mercury, but it did not fall again upon release of the juglar compression. The fluid contained a normal quantity of protein and 1 cell per cubic mm. The Wassermann reaction was negative.

Radiograms of the thoracic spine demonstrated a calcified tumor lying in the vertebral canal opposite the body of the seventh thoracic vertebra (Fig. 2). This was found to be a calcified meningioma, a firm white tumor attached to the left anterolateral aspect of the dura, displacing the spinal cord posteriorly and to the right. It was rolled out from its position beneath the cord and removed in one piece, together with the area of dura to which it was attached. The tumor was a psammoma with an unusually heavy deposition of calcium.

The patient was making satisfactory convalescence, some return of function in her lower extremities having been noted, when she died suddenly on the tenth postoperative day. Autopsy showed a pulmonary embolus to have been the cause of death.

Comment.—This case presents striking contrasts to the more typical cases first reported, and these differences may be attributed to the very slow growth of the tumor. Most dramatic, of course, is the marked calcification of the tumor, permitting the diagnosis and localization to be made by simple radiographic study of the spine. No better example of the potential value of radiographic study in cases of suspected tumor of the spinal cord could be provided.

The fact that this patient had symptoms for seven years before a correct diagnosis was made was probably due to the absence of any pain and to the domination of the clinical symptoms and signs by evidences of posterior and lateral column dysfunction. This case well illustrates the danger of making a diagnosis of systemic or degenerative disorder of the spinal cord, except in perfectly typical cases, without first excluding the presence of a slowly growing spinal cord tumor. The absence of pain, it may be noted, is not a unique circumstance, for pain was not mentioned as a complaint by 10 per cent of the patients in Learmonth's series of meningiomas of the spinal cord.

The absence of a complete block of the spinal subarachnoid space and the presence of normal cerebrospinal fluid in this case are likewise worthy of comment. The significance of partial blocking of the subarachnoid space, as demonstrated by a slow rise and slower fall in the fluid level upon performance of the Queckenstedt test, is still not generally appreciated although it has been frequently commented upon in the literature. If some quantitative method of measuring blocking of the spinal subarachnoid space, such as that proposed by Grant and Cone, were routinely employed it is probable that a number of spinal cord tumors might be detected early in the course of their growth.

Case 4.—Eleven months before coming to the University Hospital this thirty-six-year-old woman fell down a flight of stairs and thereafter complained for the first time of low back pain. Two weeks later, while lifting a heavy tub, she felt "something snap" in her back. After this the pain shifted into the right sacro-iliac region and radiated down the posterior aspect of the right thigh and leg. The pain was shooting in character, and was aggravated by coughing. It was particularly severe at night but the patient found that she could obtain relief by getting up and walking about.

The patient appeared to be in great distress. No weakness was demonstrable in her lower extremities. Kernig's and Laseque's signs were positive on the right side. The deep reflexes were hypo-active in the right lower extremity; no pathological reflexes were demonstrated. A mild impairment of pain and temperature sensibility was noted over the right buttock and thigh. Pressure over the third lumbar vertebral spine was painful.

X-rays of the lumbosacral spine disclosed no abnormality. Xanthochromic spinal fluid under low pressure was obtained by lumbar puncture at the fourth lumbar interspace and there was no rise of pressure on jugular compression. Examination of the fluid showed it to contain more than 300 mgm. of protein per c.c. and 2 cells per cubic mm.

With the intention of performing an air myelogram, a needle was subsequently inserted into the third lumbar interspace but a "dry tap" resulted, and the same thing occurred when the needle was shifted to the second interspace. It was concluded that the needles were entering the tumor, which was thereby localized by the method of multiple spinal punctures.

Removal of the laminæ of the first three lumbar vertebræ was required to expose the tumor completely, which was found to occupy a central position among the fibers of the cauda equina, being at no point adherent to the dura or any of the nerve roots. The tumor was attached to the conus medullaris near its tip by a narrow stalk which contained the vascular supply of the tumor. A single silver clip sufficed to occlude the stalk and its vessels, following which the stalk was cut and the tumor removed.

The patient made an uneventful convalescence and was dismissed from the hospital at the end of two weeks. She was seen again six and one-half months after operation, at which time she was free from pain and no neurologic abnormalities could be demonstrated.

The tumor was soft, and had a thin capsule and contained several small cysts containing yellow mucoid material. Sections showed it to be a meningioma of a cellular type.

Comment.—This case was an exception to many of the general rules which apply to meningiomas of the spinal cord and is in some respects unique. The situation of the tumor in the region of the cauda equina was unusual, but even more extraordinary was the absence of any dural attachment, a feature which is almost constant among spinal cord meningiomas. Grossly the tumor presented very much the appearance of an ependymoma of the filum terminale, lying as it did among the fibers of the cauda equina just distal to the conus terminalis. When the tumor was elevated, however, it was found to have no connection with either the filum or any of the nerve roots, and to arise from the pia mater of the conus very near its tip. Histologic study established its identity as a meningioma.

Clinically this case was a typical example of a tumor of the cauda equina. The onset of low back and right sciatic pain following an injury suggested the possibility of a protruded intervertebral disk but the neurologic findings and the results of spinal puncture indicated the presence of a more extensive lesion. The short history of typical root pain and the high protein content of the spinal fluid led to a pre-operative diagnosis of neurofibroma of the cauda equina.

This patient illustrates the fact that while we may discern patterns of behavior which will permit a pre-operative diagnosis of the histologic type of spinal cord tumor in a fair number of instances, we cannot approach complete accuracy in our predictions.

Surgical Considerations

An exact knowledge of the location of a spinal cord tumor is a prerequisite to any surgical attack if we are to avoid the extensive exploratory laminectomies which were often necessary before the development of modern radiologic methods. It is noteworthy that in none of the four cases in this series was it necessary to employ lipiodol to locate the tumor. This is not intended as a condemnation of the use of lipiodol, for it is recognized that only by its use may many spinal cord tumors be detected and localized. The irritating effects of lipiodol are of minor importance when contrasted with the potential dangers of a spinal cord tumor. It should be emphasized, however, that other simpler methods of localization are available and that these methods will suffice in many instances.

The trend of modern spinal cord surgery is toward smaller incisions, accurately placed, with the removal of just enough bone to permit adequate exposure of the lesion. In the present series of cases the removal of two pairs of laminæ permitted removal of the tumor in two instances; in the other two cases three pairs of laminæ were removed. The operative mortality rate which attends operations for the removal of the meningiomas of the spinal cord is low, the greatest risk being in the case of tumors in the cervical region where manipulation of the cord may lead to hyperthermia and death. Learmonth reported a mortality of 10 per cent in a series of cases from the Mayo Clinic. Modern operative methods, by reducing shock, and modern chemotherapy, by preventing and combatting urinary infection and pneumonia, should result in a further reduction of the operative risk. The only death in this small series was the result of a pulmonary embolus, a complication for which we as yet have no adequate prophylaxis or treatment.

Most intraspinal meningiomas can be completely removed. Exceptions to this rule are the extensive flat tumors which tend to encircle the spinal cord, and tumors placed exactly anterior to the cord, the removal of which would require a degree of displacement of the cord which is not permissible. In these cases decompressive laminectomy alone may have a beneficial, though not curative, effect. As was first emphasized by Cushing, it is essential to remove not only the

tumor but also that portion of the dura to which it is attached, if recurrence is to be avoided.

The degree of restoration of function which follows removal of a spinal cord tumor depends upon the extent of the structural changes in the cord which have resulted from the pressure of the tumor. In general, the cord is better able to adjust itself to a slowly progressive compression, even though it be of considerable degree, than to a rapidly developing compression which produces circulatory disturbances in the cord with resulting myelomalacia. Since meningiomas are a slowly growing type of tumor, a considerable degree of restoration of function may be anticipated following their removal in most cases, and such improvement may continue for over a year after the removal of the tumor.

The only series of meningiomas of the spinal cord which has been subjected to adequate follow-up study is that of Cushing, the results of which may be cited. Among seventeen patients operated upon, one died as a result of operative shock. The tumor was not removable or recurred in five patients, most of whom were operated upon before the importance of removing the involved dura was realized. Three of these five patients were operated upon a second time, with one operative fatality. The other two eventually died as a result of progression of their lesions. The tumor was completely removed and did not recur in ten patients. Two of these died after five and seven years respectively from intercurrent causes. The remaining eight patients (over one-half of those operated upon) were living and gainfully employed after periods ranging from ten to twenty-three years.

Summary

A group of four meningiomas of the spinal cord removed surgically during the past year have been reported to illustrate the clinical and surgical aspects of these tumors.

Meningiomas constitute one-fourth of all neoplastic spinal cord tumors. They are solitary, benign tumors which arise in the spinal meninges and compress but do not invade the spinal cord. Their symptoms are those of spinal cord tumors in general, consisting of varying combinations of nerve root pain and signs of spinal cord compression. A spinal cord tumor may be suspected of being a meningioma when it occurs in the thoracic region of the spine in a woman of adult years and has produced symptoms for one to two years. Occasionally a positive pre-operative diagnosis may be made by visualizing a calcified meningioma radiographically.

Most meningiomas of the spinal cord may be completely removed surgically with a gratifying restoration of function. The risk attending such operations has been reduced by refinements of technique which necessitate accurate pre-operative localization of the tumor. The subarachnoid injection of lipiodol is the most frequently employed localizing method and is the only effective method in many cases. Other and simpler methods are also available, as is demonstrated by the present series of cases in which one tumor was visualized by direct radiography, one was found by the method of multiple spinal punctures and the remaining two were demonstrated by air myelography.

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DEMONSTRABLE GENITO-URINARY DISEASE IN THE PRESENCE OF NORMAL URINARY FINDINGS*

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THE great preponderance of cases seen by the urologist in any given length of time are cases that naturally present symptoms or signs relating directly to the genito-urinary tract. However, in the course of time quite a number of patients who have little or no evidence of genito-urinary disease have been referred for study solely because examination of the other systems failed to reveal a definite cause for their complaints. Among this group a considerable number can be shown to have a definite genito-urinary disease accounting for their symptoms.

Many of these patients have undergone a large variety of diagnostic procedures covering periods of time from weeks to months. A few have been advised to accept surgical interference, frequently without any clear indications, and in many cases operations have been resorted to for removal of the appendix and gall bladder, only to find that after recovery from the surgical procedure their complaints still persisted.

It recently suggested itself to us that it might be worthwhile to ascertain what percentage of the general practice of urology this class of case represents, and to determine as far as possible what factors are responsible for these people seeking urologic consultation only when everything else has failed.

Three hundred consecutive cases, in which complete urologic study seemed necessary to arrive at an accurate diagnosis, were chosen from the files in an effort to answer these questions. Cases presenting a frank urologic picture such as the obvious prostatic syndrome were not included.

In 234 of these cases there was sufficient evidence pointing to disease of the genito-urinary tract, accompanied by pathological findings in the urine so that the physician could hardly be misled as to the location of the patient's difficulties. The remaining sixty-six cases are the ones that concern us in the present study. In this group of sixty-six, twenty-eight patients had definite disturbances of urination and the remaining thirty-eight complained of miscellaneous aches and pains but little or no symptoms suggestive of genito-urinary pathology. Prominent amongst these complaints were vague aches and dull constant pain in the superpubic region, vague backache and disturbances varying from a dull dragging sensation to actual pain in the costal-vertebral region. Both of these groups have one thing in common: they all had, upon one or more occasions, been found to have a negative urine, using the term "negative urine" to indicate a normal specific gravity, absence of albumen and sugar, and casts, white or red cells in the microscopic examination.

In discussing the possibility of genito-urinary disease with these patients and the necessity for proper examination, it became quite evident that most of them felt that because one or more voided specimens of urine had been reported as negative, there was little, if any, reason to investigate the urinary tract any further. This attitude was evident in the group of twenty-eight who had definite urinary symptoms, as well as in the thirty-eight whose complaints were vague enough to justify to some extent their attitude. Further discussions frequently elicited the information that many times it was not only the patient's evaluation of the significance of the negative urine that was misleading them, but also the emphasis placed by their physician on the importance of this single diagnostic procedure.

Among the group of twenty-eight referred to as having definite urinary disturbances, there were eleven cases of bladder neck disease, that is, chronic inflammatory changes at the vesicle neck, characterized by cysts and polyps; four cases of leukoplakia; two urethral caruncles; one papilloma of the verumontanum; ten cases of chronic, low-grade pyelonephritis, all producing symptoms sufficiently distressing to make semi-invalids out of the patients. In the ten cases of low-grade, chronic pyelonephritis, there were definite anatomical changes in the kidney pelvis demonstrated on pyelograms and the infecting agent was identified in the urine by resorting to cultures

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of the sediment thrown down by the high speed centrifuge at 3500 R.P.M. one-half hour.

The group of thirty-eight with indefinite symptomatology and the negative urinalyses constitutes the most interesting series and it is from these that eight cases have been selected for presentation. This group includes:

1 hypernephroma
1 polycystic kidney (unilateral)
1 renal tuberculosis
1 aberrant vessel
3 cases of ptosis of kidney, sufficient to produce symptoms.
1 infected hydronephrosis

It would seem desirable to present a short summary of each of these cases individually by way of illustrating the variety of serious disease that can be encountered in the presence of normal routine urinalyses. Seventeen of the thirty remaining cases showed varying degrees of pyelonephrities and low-grade chronic infections of the bladder which responded to suitable treatment. There were three severe prostatic infections which curiously enough presented no symptoms referrable to the prostate; eight showed an absence of any genito-urinary pathologic changes; two showed fibroses of the sphincter (females).

It is worth noting that routine bacteriological studies combined with the use of the high speed centrifuge and culture methods revealed bacteriological findings in the urine which explain the anatomic changes seen in the pyelograms in the cases of pyelonephritis in both groups just mentioned.



Fig. 1. Case I. Grade I pyelectasis on right; compression of pelvis by psoas muscle with some blunting of the cups.



Fig. 2. Case I. Dilatation of the ureter in the middle third and an excursion of the right kidney of about 2 inches.



Fig. 3. Case II. Kidney pulled downward and merging into a large mass with a grade II pyelectasis and obliteration of the minor calices.

Case Reports

Case 1.—Mrs. A. A., white, aged twenty-five (October 30, 1939) had a sudden attack of severe abdominal pain on the right side, commencing in the region of the gall bladder and radiating downward and to the back. There was no nausea or vomiting; the pain was markedly worse when standing and walking; it was dull and rather aching in character, but there were occasional attacks of sharp, knife-like pains. The patient sought medical advice and was advised to have the gall bladder removed, but refused operation at that time. By doing very little housework and lying down most of the time, she was able to stay fairly comfortable but she lost about 15 pounds in weight and was mentally very depressed at the time that she came to the clinic for examination.

General physical examination was negative except for some tenderness in the region of the gall bladder. This tenderness extended down the general course of the ureter. There was slight costovertebral tenderness. Blood examination revealed a hemoglobin of 90 per cent; 4,410,000 red blood cells; 9,400 white blood cells. The voided specimen was clear; specific gravity, 1.018; acid reaction; negative for albumen and sugar, with only an occasional pus cell; negative Wassermann reaction.

Upon cystoscopy the bladder wall appeared normal throughout except for a mild trigonitis which led up to the ureteral orifices on both sides. A No. 6 shadowgraph catheter passed easily to the pelvis of each kid-

ney. Ten cc. of diadrast were injected on the right; 6 cc. on the left.

The bladder specimen showed an occassional w.b.c. no organisms on direct smear, dye appearance in 3.5 minutes. There were no cells and no growth was revealed on culture from either bladder or kidney specimens. There was no evidence of disease on the flat plate. Pyelograms reveal a poorly filled left kidney (Fig. 1) but no definite evidence of disease; the right kidney is well filled and shows a grade I pyelectasis with some dilatation of the upper major calyx and a narrowing of this calyx as it leaves the pelvis. The cups show some blunting. On a film made in the upright position (Fig. 2) there is a dilatation of the ureter in the middle third; the kidney drops about two inches and the position of the kidney suggests possible interference with drainage. A 10-minute upright drainage picture shows no evidence of retention of dye.

It was felt that the ptosis observed, combined with a stricture below the dilated portion of the ureter could account for this patient's symptoms. A properly fitting kidney belt was applied and the ureter dilated to 10F. She was seen again at intervals for the past year and states that as long as she wears the belt, she is entirely free from pain and distress. She is able to do her housework and in May, 1940, she had gained fifteen pounds in weight.

Case 2.—M. B., aged thirty-two, was seen in the clinic first on June 19, 1939. His chief complaint was severe abdominal pain, generalized throughout the abdomen. There was a constant dull ache with attacks of sharp and severe pain lasting two or three hours. The pain came on suddenly about twenty-four hours before the patient was seen, lasting about four hours; morphine was necessary for relief. After the attack stopped, the patient felt entirely well. There was a recurrence about three hours later with no urinary symptoms. The patient stated that he had been perfectly well up to this time except for an attack of renal colic fifteen years ago at which time he passed a stone. At that time his attention was called to a mass in his left side. The patient and family do not believe that there has been an increase in size but upon palpation the mass appeared to be about 18 cm. by 10 cm., soft, not particularly tender, and was freely movable. The patient had been told that this mass was a floating kidney.

General physical examination was entirely negative except for the presence of the mass. Blood examination revealed a hemoglobin of 86 per cent with 5,300,000 red blood cells. Voided specimen was pale straw colored, clear, with a specific gravity of 1.006; neutral reaction, no pus, no red cells and negative for sugar, with a very faint trace of albumen. The blood Wassermann was negative. Flat plate of the abdomen showed a large mass extending from the twelfth rib and dipping below the brim of the pelvis on the left side.

Upon cystoscopy, the bladder wall appeared normal throughout. A No. 6 shadowgraph catheter passed easily to the pelvis of each kidney. Phenolsulphonephthalein appearance time on the right was six minutes; on the left no secretion was obtained and no dye appeared in a half hour. Ten c.c. of diadrast were injected and pyelograms taken. A radiograph (Fig. 3) made after the injection of diadrast showed the pelvis of the kidney pulled downward, and apparently connecting with the mass seen on the flat plate. There was a grade II pyelectasis with a marked loss of cupping. A diagnosis of renal tumor was made.

In view of the length of time that the mass had been present, the general good health of the patient, and the fact that there was some slight calcification on the lower portion, it was felt that this was probably a single cyst of the kidney. Operation was advised and a large, firm mass, 19 cm. x 6 cm. x 6 cm., arising from the lower pole of the kidney was found, which appeared to be a hypernephroma. Nephrectomy was carried out and the diagnosis of hypernephroma was confirmed by the pathologist.

Case 3.—Mrs. E. D. C., aged fifty-six, complained chiefly of intermittent attacks of chills and fever accompanied by pain on the right side, occasionally attended by severe nausea but no vomiting. In 1922 the patient had the first attack similar to the one described above. She was in bed for two weeks and was placed on a diet. Following this she was quite well until 1931 when the trouble recurred. Since that time these attacks have been becoming more and more frequent. In 1934 she was told that her difficulties were due to gallbladder disease and the gall bladder was removed. Following operation she made an uneventful recovery but her symptoms recurred within two weeks and continued up until the present time. Lately these attacks were coming about every three to four weeks and increasingly severe.

General physical examination was essentially negative. Blood examination revealed a hemoglobin of 84 per cent; 4,190,000 red blood cells; 8,800 white blood cells with a normal differential count. Voided specimen was straw colored and clear; specific gravity, 1.014; alkaline in reaction; negative for albumen and sugar; occasional pus cell; no red blood cells; negative Wassermann. In view of her history it was decided to investigate the urinary tract.

Upon cystoscopy the bladder showed a plus 2 cystitis throughout. The entire trigone was covered with bullous edema. A No. 5 shadowgraph catheter passed easily to the pelvis of each kidney and specimens were collected for study. Phenolsulphonephthalein appearance time was eight and one-half minutes on the right; four minutes on the left with 3 per cent of the dye recovered from the right; 15 per cent from the left in a 15-minute specimen. Bladder cell count showed a high powered field loaded with pus cells; culture revealed B coli growth; guinea pig inoculation negative. Specimen from the right kidney revealed numerous w.b.c.'s; culture revealed B. coli growth; negative guinea pig inoculation; left kidney specimen had an occasional w.b.c.; very rare r.b.c.; few epithelial cells; culture revealed a B coli growth; negative guinea pig. It is worthy of note that the cystoscopic examination was made four days after the specimen of urine was col-

lected which was reported as negative, but at the time of the examination of the voided specimen the patient's temperature was 102, while at the time of cystoscopy temperature was normal, suggesting that a temporary block had prevented the urine from the infected side from entering the bladder, thus accounting for the lack of findings in the urine. The patient stated that she had been told upon several occasions that "there was nothing in the urine" and it is probable that the specimens were taken under similar conditions.

A flat plate of the abdomen showed no evidence of disease. Five c.c. of diadrast were injected on the left; 12.5 c.c. on the right. The left kidney showed no evidence of disease. On the right side the renal pelvis showed grade II dilatation with marked clubbing in the middle and superior calices. (Fig. 4) twenty-minute upright drainage film (Fig. 5) showed complete retention of dye on the right side.

A diagnosis of pyonephrosis was made. On September 14, 1938, a nephrectomy was performed and the pre-operative diagnosis confirmed. This patient was seen about one year later and said that she has had no trouble of any kind since the operation.

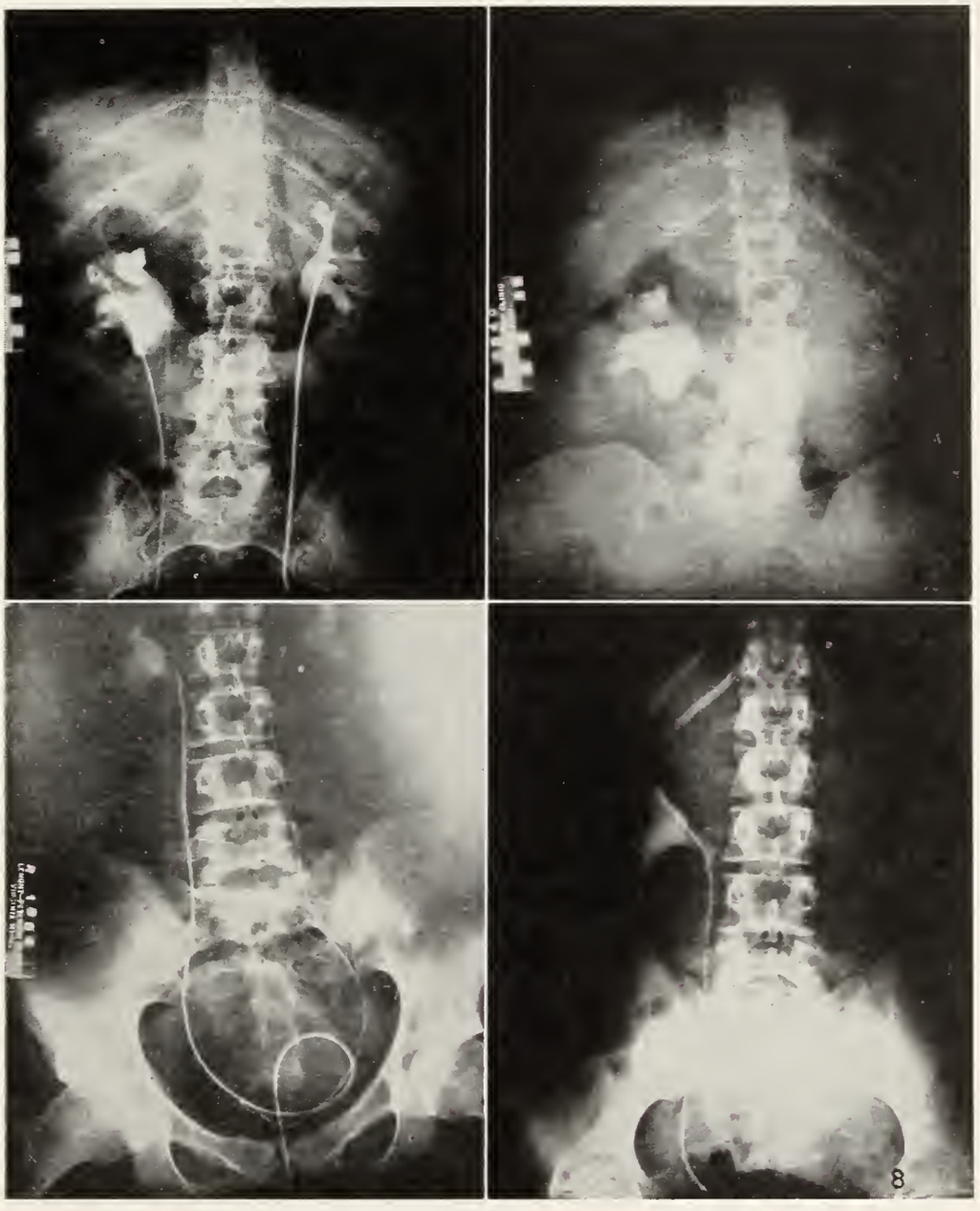


Fig. 4 *(upper left)*. Case 3. Grade II dilatation of the renal pelvis and marked clubbing in the middle and superior calices.

Fig. 5 *(upper right)*. Case 3. Roentgenogram taken twenty minutes after the removal of the catheter with patient in upright position showing complete retention of dye on the right side.

Fig. 6 *(lower left)*. Case 4. Grade I pyelectasis on the right side; middle calyx rather sharply cut off; some clubbing of the cups of the upper calyx; dilatation of the ureter.

Fig. 7 *(lower right)*. Case 4. An excursion of the kidney about 2.5 inches.

Case 4.—E. G., A female, age eighteen, complained chiefly of a mild aching and distress in the right lower quadrant, present for approximately two years. About one and a half years before, the appendix was removed but the operation was followed by no relief of symp-

toms. The ache never varied; it was practically the same night and day, though not severe enough to wake her up. She had never, at any time, had any urinary symptoms, i. e., frequency, nocturia or hematuria.

General physical examination revealed very slight tenderness at the costovertebral angle and slight tenderness over the course of the ureter, but otherwise was negative. A voided specimen taken when she first entered the clinic was negative for sugar, albumen and cells. The Wassermann reaction was negative.

Upon cystoscopy the bladder wall appeared normal throughout except in the region of the right ureteral orifice. Five or six small pin-head sized bullæ were seen; there was a small patch of leukoplakia in the lower part of the trigone, extending down into the urethra. A No. 5 shadowgraph catheter passed easily to the pelvis of each kidney. Phenolsulphonephthalein appearance time was two and one-half minutes on the left; four minutes on the right. Culture showed no growth. Guinea pig inoculation showed no evidence of tuberculosis.

Films made after the injection of diadrast show grade I pyelectasis of the right side (Fig. 6). The middle calyx is rather sharply cut off; the upper calyx is blunted and shows some clubbing. The ureter is dilated above a point of narrowing about 6 cm. below the ureteropelvic junction. A film taken in the upright position (Fig. 7) demonstrates an excursion of about two inches. A ten-minute upright drainage film shows no retention of dye.

A diagnosis of chronic pyelonephritis of the right kidney, ptosis of the right kidney, and stricture of the right ureter, was made. The ureter was dilated upon several occasions, the area of leukoplakia fulgerated and the patient was supplied with a well-fitting kidney belt. When seen about a year later she stated that while she occasionally still has some disturbance, the greater part of the time she was entirely free from symptoms.

Case 5.—Mrs. V. W. M., aged thirty-six, complained chiefly of pain in the right side, dull and aching in character. The onset of the pain was extremely indefinite but it had been present off and on for about a year and a half. Occasionally there was a sharp attack of pain lasting for only a few minutes, which radiated towards the bladder region. There was also a sense of weight in the right side. There was no history of urinary frequency, hematuria, dysurea or nocturia.

Physical examination was essentially negative except for very slight costovertebral tenderness and the right kidney could be palpated and seemed to be somewhat larger than normal. Voided specimen (July 24, 1939) had a specific gravity of 1.002; acid reaction; negative sugar and albumen; and no white or red cells. The blood Wassermann was negative.

Upon cystoscopy (July 27, 1939) the bladder appeared normal throughout. A No. 5 shadowgraph catheter was passed into the pelvis of the left kidney but could not be passed more than 10 cm. on the right side. Diadrast was injected and pyelograms were taken. At the time of cystoscopy the bladder urine showed a few clusters of white blood cells but no organisms; culture revealed no growth. No urine was obtained from the right. The phenolsulphonephthalein appearance time on the left was two minutes, five seconds; the specimen showed no growth on culture.

Films made after the injection of diadrast revealed no pathology on the left side but on the right side the dye did not go beyond the region of the ureteropelvic junction (Fig. 8) and suggested a complete block such as is seen in tumors filling the kidney pelvis. A second film taken (Fig. 9), using more dye, gave a film in which the apparent block of the ureteropelvic junction was still present, but some dye had been pushed beyond this in a thin line as though lining a cavity. Above this there was a round area which appeared to be a cavity and this round area had a feathered edge, suggestive of the type of necrosis seen in tuberculous disease. A diagnosis was made of a non-functioning kidney, due to tuberculous pyonephrosis but the possibility of a kidney tumor was also considered.

Nephrectomy was performed and a large pyonephrotic kidney was removed. The pathologist reported tuberculous pyonephrosis.

Case 6.—E. T., aged eighteen, a female, whose chief complaint was pain in the right lower quadrant, dull, aching in character, but not very severe; no nausea or vomiting. The patient stated that she had the first attack about four months prior to being seen in the clinic. She was kept in bed for three days and apparently completely recovered. About a month later she was seized with a similar attack and advised to have her appendix removed. Appendectomy was performed but shortly after she again had a recurrence of her pain. It gradually became more constant, was not colicky in nature and not very severe. There was a history of one attack of frequency of urination, lasting about three days, following the appendectomy. As the patient had been catheterized at this time, the frequency would not appear to have any special significance.

Physical examination was entirely negative except for slight costovertebral tenderness on the right side. Voided specimen was straw colored, clear; specific gravity, 1.018; acid reaction; no albumen or sugar; very occasional pus cell. The blood Wassermann reaction was negative.

Cystoscopy revealed a normal bladder throughout. A No. 5 shadowgraph catheter passed easily to the pelvis of each kidney. Bladder urine showed a very occasional w.b.c.; culture was negative. Specimen from the kidneys revealed an occasional r.b.c. and epithelial cell; culture showed no growth.

A flat film of the urinary tract showed no evidence of pathologic change. Films made after injecting diadrast showed no evidence of disease on the left side; on the right side there was a grade I hydronephrosis with blunting of the cups of the calices. The ureteropelvic junction showed a filling defect with a sharp line of demarcation, suggesting obstruction at this point (Fig.

10). A drainage film twenty minutes later, in the upright position, showed complete emptying on the left side with almost complete retention of dye on the right side (Fig. 11). This type of obstruction could be caused by an aberrant vessel arising from the lower pole of the kidney. Diagnosis was made of a stricture at the uretropelvic junction, probably due to an aberrant vessel.

Operation was performed and an aberrant vessel was found crossing the ureter at the ureteropelvic junction; the vessel was freed and divided and nephropexy was carried out at the same time. Six months later pyelograms were repeated. The obstruction was no longer present and a ten-minute drainage plate (upright) showed complete emptying of the affected side. The patient stated that she had been perfectly well since the operation.

Case 7.—C. L. B., white, male, aged fifty-four, complained chiefly of an abdominal pain, generalized over the upper abdomen, and sharp and severe in character. The pain had occurred suddenly a few hours before being seen in the clinic, was rather more severe on the left side and radiated towards the superpubic region.

General physical examination was essentially negative except for some tenderness in the left hypochondrium and along the course of the left ureter. There was a sensation to the examining hand as though a palpable mass was present which might correspond

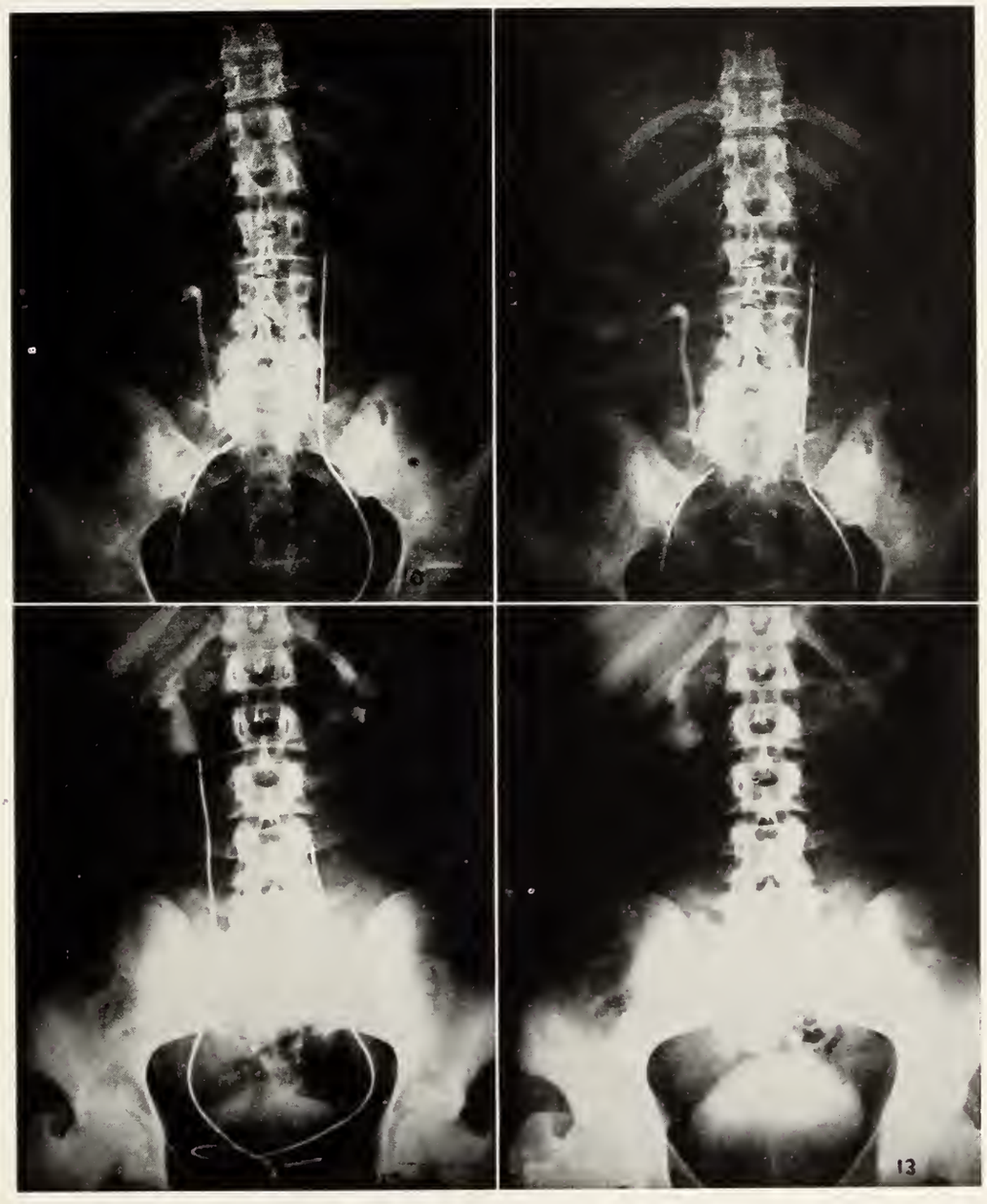


Fig. 8 *(upper left).* Case 5. Roentgenogram made after the injection of diadrast demonstrating a block at the ureteropelvic junction.

Fig. 9 *(upper right).* Case 5. After the injection of more diadrast, some of the dye may be seen escaping beyond the blocked area and apparently outlining a cavity.

Fig. 10 *(lower left).* Case 6. Roentgenogram made after the injection of diadrast showing a sharply defined filling defect at the ureteropelvic junction.

Fig. 11 *(lower right).* Case 6. Roentgenogram taken twenty minutes after the withdrawal of the catheter, patient in an upright position, showing complete retention of dye.

to the left kidney. The patient was, however, rather obese and it was difficult to be certain. A voided specimen was negative for sugar and albumen, contained no pus nor red cells, was alkaline in reaction; specific gravity, 1.018. The blood Wassermann was negative.

sisted of a large cystic mass. Pathologist reported polycystic disease.

Case 8.—Mrs. A. M., aged forty-seven, complained chiefly of nervousness, backache and pain of a dull, dragging, aching character in the right lower quadrant,



Fig. 12. Case 7. Dilatation and distortion of the pelvis of the left kidney and a newly formed cavity filled with diadrast.



Fig. 13. Case 8. Blunting of the cups of the calices on the right side; pyelectasis.



Fig. 14. Case 8. Both kidneys are shown dropping below the brim of the pelvis with consequent kinking of the ureter.

A No. 24 cystoscope passed easily into the bladder and about 2 ounces of residual urine were evacuated. There was moderate trebeculation throughout but no diverticuli were seen. There was a grade II median bar. A No. 5 shadowgraph catheter passed without difficulty into the kidney pelvis on each side. Specimens were collected for study. Phenolsulphonephthalein appearance time was 3 minutes, 45 seconds on the right; 6 minutes, 15 seconds on the left. There were 15 to 20 r.b.c.'s on the right; cultures showed no growth.

Flat plate of the kidney and bladder tract showed a considerably enlarged kidney shadow on the left side with some flaking, suggestive of calcification. A film made after injection of diadrast (Fig. 12), showed a normal kidney pelvis on the right side. The left kidney pelvis was markedly dilated. There was a large area in which dye could be seen, which suggested a newly formed cavity, connecting with the kidney pelvis and extending from the ureteropelvic junction to the lower minor calyx. The pelvis was elongated and while the lower major calyx showed evidence of dilatation, the pelvis itself was narrowed in a way suggesting encroachment. A ten-minute upright drainage picture showed retention of dye in the left kidney pelvis.

A diagnosis of cystic disease of the kidney was made. In view of the severe pain and the absence of any demonstrable pathology on the right side, operation was decided upon. Upon operation, the kidney appeared to have very little functional tissue but consent for about sixteen years. In 1922 both tubes and ovaries were removed but the patient's physical symptoms persisted off and on. About six years ago the gall bladder was removed but there was still no relief of symptoms. The patient was seen upon a number of occasions by psychiatrists who made a diagnosis of psychoneurosis bordering upon the manic-depressive type of insanity. She complained very bitterly of the dragging pain and disturbance on the right side and while giving us the impression that it probably was not very severe, there was no doubt that the already unstable nervous system was not helped any by its presence. Unable to find anything to account for her pain, gastro-intestinal x-rays showing no evidence of pathology, it was decided to investigate the urinary tract.

The voided specimen was entirely negative for pus, albumen and sugar. The blood examination was normal except for a mild anemia of a secondary type.

A No. 24 cystoscope passed easily into the bladder. The bladder wall appeared normal throughout. A No. 5 shadowgraph catheter was passed to the pelvis of each kidney. Phenolsuphonephthalein appearance time on the left was three minutes, fifteen seconds; on the right, four minutes thirty seconds. Six c.c. of diadrast were injected and pyelograms taken (Fig. 13). Pyelograms revealed a marked ptosis of both kidneys (Fig. 14), with poor drainage on the right side.

This patient was advised to wear a kidney support and she states that at the present time, about two

months after wearing the support, she has no aching or distress in the right side. Her mental condition has, at least temporarily, improved. It is possible that the removal of the physical distress may relieve the mental symptoms to some extent.

It is interesting to note that the left kidney is apparently producing no symptoms. In view of the patient's mental condition, it is very difficult to evaluate the symptoms and also the measure of relief afforded. It will be of great interest to follow this case for a period of time and to observe whether or not the relief afforded in both the mental and physical condition by a relatively simple procedure is only transitory or is sufficiently permanent to justify regarding this patient as "cured."

Summary

Out of 300 consecutive cases in which complete urological study was required for diagnosis, two hundred and thirty-four showed definite findings in the urine, while sixty-six showed no abnormal findings in the urine.

Of this group of sixty-six, twenty-eight had definite disturbances of urination, while thirty-eight had no symptoms pointing directly to the urinary tract.

Conclusions

The above studies suggest that while the pitfalls of the voided specimen in the female are well recognized and most men check with a catheterized specimen, if pus cells or organisms be present, the pitfalls presented by reliance upon the voided specimen when negative, especially if only one is taken, are not so generally recognized. In the absence of definite findings in cases of obscure abdominal distress, it would probably be wiser to investigate the urinary tract than to subject the patient to major operations. Cystoscopy is a rather innocuous procedure and an easier way to approach the problem than by exploratory operation. Even though cystoscopic examination is not resorted to, the routine methods of examination of the urine could be supplemented by high speed centrifuging and the growing of cultures, procedures which are not technically difficult, but which would frequently disclose the presence of active disease of the genito-urinary tract as evidenced by the number of cases of pyelonephritis in the above series in which positive urinary findings were found by these methods.

SULFONAMIDE TREATMENT OF GONOCOCCAL URETHRITIS

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RECENT reports on the treatment of gonococcal infections show waning interest in sulfanilamide and increasing enthusiasm for other sulfonamide derivatives. This study was undertaken in an effort to evaluate the various types of therapy which have been employed at the Ancker Hospital from July 1, 1938, to January 1, 1941.

During this thirty-month period 134 males with acute gonococcal urethritis were followed for sufficient time to permit detailed analysis. Diagnosis in each case was made by smears and cultural methods. Ten patients were admitted to the hospital and 124 were treated in the out-patient department. In 106 cases the infection was limited to the anterior urethra, while twenty-eight showed involvement of the posterior urethra (as demonstrated by the three-glass test).

Treatment conformed to five distinctly separate groups: (1) sulfanilamide alone—fifty-six cases; (2) sulfanilamide and simultaneous urethral irrigations—fifty-seven cases; (3) sulfapyridine—ten cases; (4) neoprontosil—eight cases; (5) sulfathiazole—twenty-five cases. Several patients received more than one sulfonamide derivative because of initial failure or drug sensitivity, thus explaining the increased total number of cases in these therapeutic groups and in the subsequent analyses. The results are summarized in Table I.

Sulfanilamide Alone

An attempt was made to cure fifty-six patients with sulfanilamide alone. One patient had been treated with neoprontosil without success. All others had received no previous treatment. In

TABLE I. SUMMARY OF SULFONAMIDE TREATMENT OF ACUTE GONORRHEA IN MALES

Treatment	Total Cases Treated		Cured by One Course		Recurrence; Cured by Second Course		Total Cured		Unable to Tolerate Drug		Failures	
			No.	%	No.	%	No.	%	No.	%	No.	%
Sulfanilamide Alone	Anterior	42	19	45.2	3	7.2	22	52.4	1	2.4	19	45.2
	Posterior	14	6	42.8	0		6	42.8	2	14.4	6	42.8
	Total	56	25	44.6	3	5.4	28	50.0	3	5.4	25	44.6
Sulfanilamide and Urethral Irrigations	Anterior	46	26	56.5	7	15.2	33	71.7	1	2.2	12	26.1
	Posterior	11	6	54.5	0		6	54.5	2	18.2	3	27.3
	Total	57	32	56.1	7	12.3	39	68.4	3	5.3	15	26.3
Sulfapyridine	Anterior	6	5	83.3	0		5	83.3	0		1	16.7
	Posterior	4	2	50.0	0		2	50.0	1	25.0	1	25.0
	Total	10	7	70.0	0		7	70.0	1	10.0	2	20.0
Neoprontosil	Anterior	6	4	66.7	1	16.6	5	83.3	0		1	16.7
	Posterior	2	2	100.	0		2	100.	0		0	
	Total	8	6	75.0	1	12.5	7	87.5	0		1	12.5
Sulfathiazole	Anterior	22	17	77.3	3	13.6	20	90.9	0		2	9.1
	Posterior	3	3	100.	0		3	100.	0		0	
	Total	25	20	80.0	3	12.0	23	92.0	0		2	8.0

forty-two cases the infection was limited to the anterior urethra. In fourteen instances there was posterior involvement. The urethral discharge had been present for one week or less in forty cases, for eight to fourteen days in seven cases, and for fifteen to twenty-one days in nine cases.

Cures.—Twenty-five patients (44.6 per cent) were cured by 1 course of sulfanilamide without supplementary treatment of any type. The cases with posterior involvement responded almost as well as those in which only the anterior urethra was infected (Table I).

Sulfanilamide was administered daily in four equally divided doses and accompanied by equal amounts of sodium bicarbonate. Each patient was started on at least 60 grains (3.96 grams) per day and many received 80 grains (5.28 grams) or more as the initial daily dose. The dosage was reduced to 40 grains (2.64 grams) each day at the end of one or two weeks in those cases which received prolonged chemotherapy. The duration of treatment varied from seven to fifty-four days with the majority of the patients receiving the drug for fourteen to twenty-one days. In most instances sulfanilamide was continued until the urine became perfectly clear in all three glasses. The urethral discharge disappeared in two to thirty days with only five persisting for more than two weeks. Over 50 per cent had no discharge after one week of treatment.

These patients were followed for at least three months after chemotherapy was stopped and many were observed for one or two years. No recurrences occurred despite passage of urethral sounds, prostatic massage and the usual provocative tests.

Three additional patients (with only anterior urethritis) required a second course of sulfanilamide before they were cured. Each had been given 60 grains (3.96 grams) daily for one week, followed by 40 grains (2.64 grams) each day for an additional week. The discharge disappeared within seven days in each case but recurred shortly after the drug was stopped. The second course of sulfanilamide consisted of 40 grains (2.64 grams) daily for twenty-one, fourteen and six days, respectively. Following this there was no further recurrence during the next twelve months.

By including those patients who required two courses of sulfanilamide, cures were obtained in 52.4 per cent of the uncomplicated cases and in 42.8 per cent of those with posterior involvement.

Toxicity.—Three patients in this group were unable to tolerate sulfanilamide and the drug was discontinued before cures were affected. One patient developed fever, nausea and vomiting after taking 60 grains (3.96 grams) daily for four days, another had the same symptoms after receiving 40 grains (2.64 grams) daily for three days, and the third developed dermatitis after taking 40 grains (2.64 grams) daily for seven days. These symptoms disappeared after withdrawal of sulfanilamide. All three patients were cured subsequently by other methods. Several additional patients had mild toxic manifestations (e.g., cyanosis, headache, general malaise) which failed to prevent completion of their treatment.

Failures.—Twenty-five (44.6 per cent) of the fifty-six patients in this group were able to tolerate sulfanilamide for at least two weeks in doses of 40 to 80 grains (2.64 to 5.28 grams) daily but continued to show gonococci in urethral smears or cultures. The incidence of failure was essentially the same in cases limited to the anterior urethra as in those with posterior urethritis (Table I). Of these twenty-five sulfanilamide failures, eight were cured later with urethral irrigations (protargol or argyrol), six responded to sulfathiazole, four were cured with sulfapyridine, three became sterile with neoprontosil and the remaining four were still infected when last seen. All four of these had posterior involvement.

Sulfanilamide and Urethral Irrigations

Fifty-seven patients were treated with sulfanilamide and urethral irrigations simultaneously. The infection was confined to the anterior urethra in forty-six cases and the posterior urethra was involved in eleven patients. None had received any previous treatment. Urethral exudate had been noted for one week or less in thirty-nine cases, for one to two weeks in five cases and for two to three weeks in thirteen cases.

Cures.—Thirty-two patients (56.1 per cent) were cured by one course of combined treatment.

Very little difference was observed with the complicated and uncomplicated cases (Table I).

Sulfanilamide was administered in the same manner as in the preceding group. All of the patients were started on 60 grains (3.96 grams) of sulfanilamide daily. In most cases the dosage was reduced to 40 grains (2.64 grams) per day after one or two weeks. Local therapy consisted of anterior urethral irrigations with protargol (0.25 per cent) or argyrol (5 per cent) three times daily. Combined treatment was continued for five to forty-nine days and in most instances was maintained for twenty-one to twenty-eight days because of shreds in the urine. The urethral discharge disappeared in one to twenty-nine days with only six lasting more than two weeks. Sixty per cent of the patients had no discharge within one week.

All of these thirty-two patients conformed to the accepted standards for cure and no recurrences have been noted. Many have been followed for two years since treatment was discontinued.

Seven additional patients (with infection limited to the anterior urethra) required a second course of treatment. All of these had received an average of 50 grains (3.3 grams) of sulfanilamide daily for twenty-one days or more. The discharge ceased within ten days in each case but recurred promptly after cessation of treatment. The second course of therapy consisted of 40 to 80 grains (2.64 to 5.28 grams) of sulfanilamide daily for from nine to twenty-one days, accompanied by protargol irrigations. No further recurrences were noted.

In this group of fifty-seven patients who received combined therapy, cures were obtained in 71.7 per cent of the uncomplicated cases and in 54.5 per cent of those with posterior involvement.

Toxicity.—Three patients were unable to tolerate sulfanilamide. All three developed dermatitis after taking 60 grains (3.96 grams) daily for five, six and nine days, respectively. This disappeared in each case after withdrawal of the drug. All three patients were treated subsequently with irrigations alone. One developed a prostatic abscess which required drainage, another had cessation of the urethral discharge but developed polyarthritis and the third was still infected when last seen.

Failures.—Fifteen (26.3 per cent) of these fifty-seven patients remained infected after taking 60 grains (3.96 grams) of sulfanilamide daily for at least two weeks. Very little variation was noted between complicated and uncomplicated cases (Table I). Of these fifteen failures, three were cured later with irrigations alone, two were cured with neoprontosil, two responded to sulfapyridine and eight remained infected. (Four of these developed acute epididymitis while receiving irrigations only.)

Sulfapyridine

No attempt was made at this institution during the past thirty months to compile a series of cases treated with sulfapyridine. Only ten patients were given this drug and while the group is too small for adequate comparison, it is included to complete this study.

All ten patients had failed to respond to some other sulfonamide derivative. Eight had been treated previously with sulfanilamide and two had received sulfathiazole without success. In each case the first drug had been given for at least seven days with a minimum daily dose of 60 grains (3.96 grams). Six patients had only anterior urethritis and four had posterior involvements.

Sulfapyridine was administered in four daily doses of 1 gram (15.4 grains) each for five to twenty-eight days, with comparable amounts of sodium bicarbonate. Only three patients received this drug for more than fourteen days.

Seven patients (70 per cent) were cured. These included two of the four cases with posterior urethritis. Three patients had no discharge within three days and in none of the seven cases did it persist for more than seven days. All seven patients were followed for at least three months without recurrence.

One patient developed nausea, vomiting, dizziness and general malaise after only three days of treatment and was cured later with urethral irrigations.

Two patients received sulfapyridine for fourteen and twenty-one days but continued to show gonococci in urethral smears. Both of these failures responded later to irrigations.

Neoprontosil

Only eight patients were treated with neoprontosil but this group is included to complete the analysis.

Five of the patients had failed to respond to 60 grains (3.96 grams) of sulfanilamide daily for at least nine days. The other three had no previous treatment. Six patients had only anterior urethritis and two had infection of the posterior urethra.

Neoprontosil was given in daily doses of 40 to 60 grains (2.64 to 3.96 grams) for ten to forty days, with equal amounts of sodium bicarbonate. Only one patient was treated for less than two weeks.

Six patients (75 per cent) were cured by one course of neoprontosil. These included both cases of posterior urethritis. The urethral discharge stopped in five to fourteen days and no recurrences were noted in four to eighteen months after treatment was discontinued.

One patient had recurrence of the discharge after receiving an average of 50 grains (3.3 grams) daily for twenty-eight days but was cured by a second course of 60 grains (3.96 grams) per day for thirty days. No further recurrence was noted during the next eight months.

Another patient (with only anterior involvement) received 60 grains (3.96 grams) each day for twenty days without improvement but was cured later with sulfanilamide.

No toxic manifestations were encountered in this group.

Sulfathiazole

From July 1, 1940, to January 1, 1941, we treated twenty-five cases of acute gonococcal urethritis with sulfathiazole alone. These are summarized in Table II. Three patients had involvement of the posterior urethra and the infection was limited to the anterior portion in the remaining twenty-two cases. Six patients had failed to improve after taking 40 to 80 grains (2.64 to 5.28 grams) of sulfanilamide daily for at least fourteen days. Another patient had been unable to tolerate sulfanilamide because of toxic manifestations. The remaining eighteen patients had received no previous treatment. The urethral discharge had been noted for seven days or less in twenty-one cases and for eight to fourteen days in four instances.

Cures.—Twenty patients (80 per cent) were cured promptly by one course of sulfathiazole. These included the three cases of posterior urethritis.

Sulfathiazole was administered in equally divided doses every six hours. No sodium bicarbonate was given and all patients were instructed to take at least 2500 c.c. of fluids daily while being treated with sulfathiazole. Three patients in this group were given 2 grams (30.8 grains) daily for seven to ten days while the others received 4 grams (61.6 grains) each day for four to nineteen days. Only eight patients were treated for more than ten days (Table II). All received sulfathiazole until the urine was entirely clear. In two cases no trace of urethral exudate could be found twenty-four hours after treatment was started. The longest duration of discharge in any of the cured patients was ten days and most had cessation within one week.

Each patient was subjected to urethral massage over a sound, prostatic massage and repeated examinations and cultures of the urine and prostatic fluid. Every patient in this group has had at least two negative cultures after sulfathiazole was discontinued. All have been observed for at least two months and five have been followed for five months or more without evidence of recurrence.

Three additional patients (with only anterior involvement) had recurrence of the urethral discharge four, nine and twenty-eight days after sulfathiazole was discontinued. Each of these was cured by a second course which lasted five to seven days. No further recurrences have been observed.

By including those patients who required a second course of treatment, cures were obtained in 92 per cent of the twenty-five patients treated with sulfathiazole.

Toxicity.—All patients were seen at intervals not exceeding three days while taking sulfathiazole. Urethral smears, urine examinations, blood counts and hemoglobin determinations were made on each visit. No toxic manifestations of any type were encountered.

Failures.—Two patients (8 per cent) received 4 grams (61.6 grains) of sulfathiazole for seven and eleven days but continued to have gonococci in the urethral exudate. In both of these cases the infection was confined to the anterior urethra. Both were cured later with sulfapyridine.

TABLE II. SUMMARY OF TWENTY-FIVE CASES OF ACUTE GONORRHEA TREATED WITH SULFATHIAZOLE

	Type of Urethritis	Previous Treatment	Sulfathiazole			Result
			Daily Dosage (Grams)	Days Given	No Discharge (Days)	
1.	Posterior	None	4	6	1	No recurrence 6 mo.
2.	Anterior	Sulfanilamide	4	8	7	No recurrence 6 mo.
3.	Anterior	Sulfanilamide	4	4	2	Recurrence 4 days later. Second course: 7 days, same dose. No recurrence 5 mo.
4.	Anterior	Sulfanilamide	4	14	7	No recurrence 5 mo.
5.	Anterior	Sulfanilamide	2	8	8	No recurrence 5 mo.
6.	Anterior	Sulfanilamide Toxicity	2	7	7	No recurrence 5 mo.
7.	Posterior	Sulfanilamide	4	8	8	No recurrence 4 mo.
8.	Anterior	None	4	15	8	No recurrence 4 mo.
9.	Anterior	None	4	7	3	No recurrence 4 mo.
10.	Posterior	Sulfanilamide	4	8	8	Recurrence 9 days later. Second course: 5 days, same dose. No recurrence 4 mo.
11.	Anterior	None	4	19	2	No recurrence 3 mo.
12.	Anterior	None	4	8	8	No recurrence 3 mo.
13.	Anterior	None	4	11	1	No recurrence 3 mo.
14.	Anterior	None	4	12	4	No recurrence 3 mo.
15.	Anterior	None	4	12	5	No recurrence 3 mo.
16.	Anterior	None	4	5	2	No recurrence 3 mo.
17.	Anterior	None	4	9	6	No recurrence 3 mo.
18.	Anterior	None	2	7	7	Recurrence 28 days later. Second course: 7 days, same dose. No recurrence 3 mo.
19.	Anterior	None	4	17	10	No recurrence 2 mo.
20.	Anterior	None	2	10	4	No recurrence 2 mo.
21.	Anterior	None	4	11	7	No recurrence 2 mo.
22.	Anterior	None	4	7	2	No recurrence 2 mo.
23.	Anterior	None	4	6	3	No recurrence 2 mo.
24.	Anterior	None	4	11	Persisted	Failure—cured with sulfapyridine
25.	Anterior	None	4	7	Persisted	Failure—cured with sulfapyridine

Comment

Blood concentrations of sulfanilamide and sulfapyridine were obtained in a relatively small percentage of the total cases treated and in those instances appeared to be of little or no significance. In the more recent series of patients treated with sulfathiazole, the blood levels were consistently low and of no prognostic value. Similar findings were noted by most of the other writers on sulfathiazole treatment of gonorrhea.

Summary

From July 1, 1938, to January 1, 1941, 134 males with acute gonococcal urethritis were treated with various sulfonamide derivatives at the Ancker Hospital. Most of these were treated in the out-patient department. Several required

more than one type of drug before the infection disappeared.

Cures were obtained in 50 per cent of the fifty-six patients treated with sulfanilamide alone; in 68.4 per cent of the fifty-seven treated with sulfanilamide and urethral irrigations; in 70 per cent of ten patients treated with sulfapyridine; in 87.5 per cent of the eight who were treated with neoprontosil; and in 92 per cent of twenty-five patients treated with sulfathiazole.

In a few instances a second course of treatment with the same drug effected cures when recurrence followed the first course of chemotherapy.

Toxic manifestations were encountered with sulfanilamide and sulfapyridine and in several cases the drug had to be discontinued before the patients were cured. No toxicity was noted in the small number of patients treated with neoprontosil or the twenty-five who received sulfathiazole.

Failures occurred with each of the five methods of treatment and no doubt are to be expected because of individual variations in therapeutic response and drug sensitivity. All four sulfonamide derivatives included in this study appear to be of some value in the treatment of gonorrhea but sulfathiazole promises to be the most efficacious.

Patients who fail to respond favorably to one sulfonamide derivative after one week of adequate dosage should be tried on another of these related compounds. Prolonged treatment with the same drug in refractive cases appears to be of value only in isolated instances.

The sulfonamide derivatives are suitable for office or out-patient administration but such patients should be seen at frequent intervals and have systematic reviews of all subjective and objective toxic manifestations.

INTESTINAL OBSTRUCTION DUE TO FOOD*

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THE great majority of intestinal obstructions are due to causes extrinsic to the lumen of the bowel. Obturation or obstruction of the lumen from within may be due to gallstones, foreign bodies, enteroliths, worms, meconium in the newborn and fecal obstruction in the large bowel such as the well known fecaliths in the appendix and in Hirschsprung's disease. Obturation made up 2 per cent of a series of 335 cases of intestinal obstruction reported from the Massachusetts General Hospital in 1932.[19] In a series of 875 acute intestinal obstructions exclusive of hernia, neoplasms or peritonitis reported from the Charity Hospital in New Orleans in 1939, 5.8 per cent were due to obturation.[25] Five of the fifty-one cases were due to food.

Enterolith obstruction is seen commonly in horses but rarely in man. However it may be more frequent in man than hitherto indicated in the literature. Enteroliths may be divided into three classes.

1. True enteroliths usually have a small nucleus which may consist of intestinal epithelium, a small fecal mass, fruit stone, gallstone or other foreign body about which alkaline mineral salts of calcium, phosphorus, magnesium or ammonium may be deposited. They are found usually in the large intestine or terminal ileum. They develop in the presence of stasis in an alkaline medium.

2. Mixed stones or food boli usually have husks or fruit peelings as a nucleus. They may contain legumes, fruits, oats, vegetables, meat, seeds and a number of other substances, even grasshoppers as reported by Caleveart from the Belgian Congo, in 1933.

3. Medication enteroliths form following prolonged administration of calcium, magnesium, bismuth or phenyl salicylate.

The term bezoar comes from the Persian "padzahr," meaning antidote or the Arabian "badzehr" of the same meaning. In certain countries of the Far East it was believed that the con-

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cretions found in the stomach and intestines of ruminants and occasionally in man had certain antidote and therapeutic value. Such views still are entertained there. Bezoar was admitted into the London pharmacopœia as an official remedy until the middle of the eighteenth century.

Food as a cause of intestinal obstruction was described in 1910 by Eichorst of Germany.[9] In 1932 Elliott[10] collected twenty-six cases proven by operation or necropsy. All but ten were reported out of Germany and Austria and most from the time of World War I, when oats were eaten in Russia and so-called "ammunition bread," containing poppy seeds, was eaten in Germany. In 1936 Caylor and Nickel[5] reported two episodes in the same individual. Leisinger[18] collected sixty-six cases from the literature in 1937. There were only eight cases from the United States. Johnson of Minneapolis reported obstruction of the ileum from an apricot.[17] Following a discussion of this subject we will report two cases operated on by one of us (Mattson).

Etiology

Predisposing factors in obstruction from food have been thought to be (1) such as slow the intestinal stream, (2) increased age with an atonic digestive tract and perhaps deficient digestive mechanism, (3) drinking of large amounts of water with meals, which may dilute the digestive juices and cause swelling of vegetable fibers and (4) constipation with excessive dehydration. The habit of swallowing food whole by the hurried adult and food bolting by children has been shown repeatedly to be a factor. Inefficient chewing is encouraged by ill fitting or no artificial teeth. About half the patients are edentulous. The character of the food is important. Persimmons are a frequent cause. The skins contain shibuol, a cement substance which, when precipitated by the hydrochloric acid of the gastric juice, agglutinates the seeds and fibers into a bezoar.

Clinical Features

Obstruction from food reacts on the patient in a manner similar to obstruction by other intraluminal foreign bodies. A palpable intra-abdominal mass sometimes can be felt. Roentgen findings are the same as in other forms of obstruction. Occasionally it is possible to visualize the foreign body and, therefore, it is well to have a clear roentgenogram where intraluminal obstruction is suspected.

Upon opening the peritoneal cavity abnormal accumulations of fluid are found ordinarily. Usually the terminal ileum is involved, next the upper ileum and more rarely the jejunum. Occasionally the bowel over the mass is gangrenous and perforations have been reported. However, food boli usually are soft and putty-like and hence do not erode the bowel as often as gallstones and other foreign bodies. If the obstruction is near the ileocecal valve, the mass soft and the condition of the bowel wall permits, attempts usually are made to break the mass up and milk it into the cecum. In the majority of cases the bowel has been opened and the bolus extracted. Occasionally an enterostomy tube has been placed proximal to the obstruction.

Case 1.—Mrs. G. H., sixty-two, was admitted to the hospital May 1, 1937, at 1:30 p.m. At noon April 28 she had eaten large amounts of cocoanut. The evening of April 28 she was seized with crampy colicky pains followed by nausea and vomiting. The cramps were most marked below and to the left of the umbilicus. There were occasional remissions in which the cramps "eased up a bit." She had scanty bowel movements April 29 and April 30. She had been constipated for over twenty years and has been addicted to cathartic abuse. In 1923 she was operated on for peptic ulcer. In 1934 she had an attack of dysuria.

Physical examination showed a moderately obese woman with a moderately distended abdomen. Borborygmi were heard most marked over the left abdomen and were synchronous with abdominal cramps. There was a sense of fullness in the left flank. Her temperature was 100, pulse 110, and respirations were 22.

Urinalysis showed a specific gravity of 1030, straw color, a trace of albumen, no sugar, an occasional granular cast and three to four pus cells in the high dry field after centrifugation for three minutes. The hemoglobin was 92 per cent. There were 4,790,000 red cells and 6,600 white cells in each cubic millimeter of blood. Differential count of 300 cells showed an average of 67.2 polymorphonuclears, 20.6 lymphocytes, 11.6 monocytes and .6 plasma cells in each hundred counted. The Kahn was negative. There was no occult blood in the stool. An enema yielded a few shreds of cocoanut. A scout film of the abdomen showed gas in the small bowel.

A diagnosis of intestinal obstruction was made, nasal suction begun and parenteral fluids given. Symptoms became aggravated and she was operated on eight hours after admission under spinal anesthesia, 150 milligrams of procaine crystals being used.

A left paramedian incision was made. When the abdomen was opened several loops of dilated red bowel presented. The distended bowel was followed to a point where a putty-like mass was palpable in the lumen. About 12 centimeters beyond the mass several

loops of bowel were kinked by old adhesions. The bowel at this point was freed.

The postoperative convalescence was not entirely satisfactory. The day following operation she had a small liquid stool containing numerous white shreds of cocoanut. Nasal suction was discontinued after forty-



Fig. 1. Case 2. Scout film showing layering of gas in lower ileum from obstruction due to food bolus.

eight hours, and a liquid diet and a half-ounce mineral oil given three times a day. On the third, fourth, twelfth, fourteenth and fifteenth postoperative days she had abdominal discomfort followed by nausea and vomiting. She was discharged from the hospital on the eighteenth postoperative day.

Case 2.—Mrs. A. H., aged fifty-one, was admitted to the hospital at 11 p.m. February 24, 1939, complaining of intermittent colicky abdominal pain of thirty-six hours duration. The afternoon of February 23 she vomited four or five times following cramps. February 24 she felt fairly well until late afternoon, when the cramps and vomiting returned. She later recalled having eaten large amounts of chicken skins and some chicken about twenty-four hours before the onset of her cramps. The afternoon of February 24 she was given frequent enemas by her family. The enemas failed to relieve her. There was a little fecal matter with the first enema and some bright red blood with the last. There had been no abdominal operation previously and there was no history of any abdominal disturbance. She had never been constipated, she said. She had suffered fracture of the right wrist about three weeks before admission to the hospital.

Physical examination showed a woman of average build with moderate distention of the abdomen. There was generalized mild tenderness throughout the abdomen and borborygmi were heard synchronous with



Fig. 2. Case 2. Foreign body containing chicken skins removed from lower ileum.

intermittent abdominal cramps. Her temperature was 100, pulse 100 and respirations 22. The remainder of the physical examination revealed nothing abnormal.

The Wassermann was negative. Urinalysis was negative. There were 11,300 white cells in each cubic millimeter of blood. A scout film of the abdomen with the patient lying down (Fig. 1) showed ballooning and layering of the terminal ileum.

Nasal suction was begun and fluids were given parenterally. The next morning another scout film showed an increase in the amount of gas in the small intestine and operation was advised.

A low midline incision was made. Greatly distended and injected small intestine presented into the wound. There was no evidence of adhesions within the abdomen. A putty-like intraluminal foreign body was found in the ileum about 40 centimeters from the ileocecal valve. The bowel distal to the foreign body was collapsed. The proximal bowel contained smaller pieces of the putty-like material for a distance of about a meter. It was impossible to move the bolus distally and to crush it threatened too great injury to the bowel wall. The bolus was moved proximally about 20 centimeters and removed through a longitudinal incision opposite the mesenteric attachment. The wall of the ileum was closed transversely. The mass contained chicken skins.

Postoperative nasal suction was instituted at once and fluids given parenterally. Nasal suction was discontinued on the fifth postoperative day and the patient was discharged on the twenty-third postoperative day. On April 30, 1941, she reported she had been well since the operation.

A review of the literature between January 1, 1932, and January 1, 1940, shows an increasing number of cases reported from the United States.

A variety of substances obstructed the bowel, viz.: green corn in the terminal ileum,[19] bran in the terminal ileum,[19] radish and garlic in the jejunum,[22] orange pulp in the lower ileum,[3] grapes in the terminal ileum[18] and in the jejunum,[16] apple in the ileum and a potato three months later in the same ileum,[5] persimmons in the ileum (two cases),[14] collards in the terminal ileum,[12] dried fruit,[20] dried peach at the ileocecal juncture and orange in the lower ileum,[18] dried peach at the ileocecal juncture,[13] dried peach in the small intestine,[2] psyllium in the terminal ileum,[11] oranges in the terminal ileum,[21] dried fruit,[1] clove of garlic,[6] straw,[15] watermelon seeds (two cases), peanuts, beans, potato,[25] dried apple,[23] fig,[8] persimmons in the ileum (two cases),[7] and turtle eggs.[24]

Summary and Conclusions

Intestinal obstruction due to foods probably occurs more commonly than the operations for it would indicate.

Review of the literature since 1932 shows an increasing number of cases being reported from the United States.

Many cases of so-called "ptomaine poisoning" and intestinal upsets due to food in reality may be short lived intestinal obstructions due to food.

Two cases of intestinal obstruction due to food, proven at operation, are recorded.

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Sulfadiazine

The Council on Pharmacy and Chemistry has given consideration to further sulfonamide derivatives; in particular, the 2-sulfanilamidopyrimidine homologue of sulfanilamide, for which it has recognized the nonproprietary name sulfadiazine. In this connection the Council has considered a preliminary report on sulfadiazine prepared by Dr. Perrin H. Long, and authorized its publication. Sulfadiazine has been distributed for experimental use and clinical investigation. Dr. Long reports that it is too early to make a statement regarding the relative clinical therapeutic merits of sulfadiazine, sulfanilamide, sulfapyridine and sulfathiazole. Their experience to date, however, leads them to believe that sulfadiazine is slightly less effective than sulfapyridine or sulfathiazole in the treatment of pneumococcic pneumonia in human beings; that it is of definite value in the treatment of hemolytic streptococcus and staphylococcic infections in man; and that it produces fewer toxic manifestations than either sulfanilamide,, sulfapyridine or sulfathiazole. According to Dr. Long, there is insufficient information at hand on which to establish adequate standards of dosage wth sulfadiazine. Dr. Long concludes: The evaluation of this new chemotherapeutic agent will necessitate extensive experimental and clinical investigation in order to determine its true value. Until the time when such data are available, it is to be hoped that preliminary enthusiasms will not outrun the common sense which we have gained as a result of our experiences with sulfanilamide and its other derivatives during the past five years. (*Jour. A.M.A.,* May 24, 1941, p. 2399.)

CHEMOTHERAPY OF PNEUMONIA
(A Review of 233 Cases)

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GEORGE E FAHR, M.D.

The case is that of a sixty-year-old white man who was admitted to the hospital on March 15, 1941, and who expired thirteen days later. At the time of admission very little history could be obtained because the patient was in a state of acute alcoholic intoxication. It was learned that the patient had been suffering from an upper respiratory infection for three weeks prior to admission and that he had been drunk for approximately the same length of time. Physical examination revealed the temperature to be 105.5 degrees, the pulse 130 per minute, and the respirations 24 per minute. The patient was well developed and well nourished. He was obviously very drunk. There was a purulent exudate in both conjunctival sacs. The pharynx was injected. Examination of the chest revealed impaired resonance and high-pitched breath sounds associated with many crepitant râles in the right base posteriorly. The heart sounds were difficult to hear because of the noisy breathing. The blood pressure was 130/70. The abdomen and the extremities were negative. An x-ray film of the chest revealed an extensive density in the region of the right lower lobe which was interpreted as lobar pneumonia.

Laboratory findings: Wassermann negative, hemoglobin 75 per cent, erythrocyte count 3,800,000, leukocyte count 25,000, of which 89 per cent were polymorphonuclears. Urine negative. Type VII pneumococci were recovered in the sputum.

The patient was placed in an oxygen tent and sulfathiazole was administered intravenously. This was continued and adequate blood levels of the drug were obtained but the patient showed very little clinical improvement. The temperature continued to vary between 100.8 and 103 degrees. The leukocyte count dropped to 12,000 and remained at that level during the remainder of the hospital stay. An electrocardiographic tracing was taken on March 17 which revealed a slight depression of ST_1 and ST_2, a left axis deviation, but was otherwise normal. On March 20 the temperature rose to 105 degrees and the patient had two tonic and clonic convulsions. He was given 120,000 units of specific serum on that day and the dose was repeated on the following day. At this time a spinal puncture was done and 30 c.c. of turbid fluid were obtained which was under increased pressure. The fluid contained 230 mg. of protein and 13,000 leukocytes per cubic millimeter. Type VII pneumococci were isolated in the spinal fluid. On March 22 the patient was given sulfapyridine because of the meningitis. He had had no other clinical evidence of meningitis than the two convulsions. He was given 50 c.c. of 2 per cent sodium sulfapyridine intrathecally on March 23 and this was repeated daily thereafter. The level of the drug in the spinal fluid was maintained between 10 and 12 mg. per cent and that in the blood between 7 and 16 mg. per cent. On March 26 he was comatose and developed opisthotonus and a facial nerve paralysis. Two days later his temperature was 107 degrees and he expired.

Clinical Diagnoses: Lobar pneumonia, pneumococcic meningitis, acute and chronic alcoholism.

Anatomic Findings (Dr. Martin Buehler): There was cyanosis of the skin and membranes. There was no edema or jaundice. The peritoneal cavity was negative. The liver was enlarged and extended 9 cm. below the right costal margin. Both pleural cavities contained fresh, fibrinous adhesions between the lung and the parietal pleura. The heart muscle was pale and soft and the chambers appeared to be slightly dilated. There were no myocardial scars. The heart valves were normal. The coronary arteries showed only minimal sclerotic changes. The right lung weighed three times and the left lung twice its normal weight. The posterior portion of the entire right lung and the left lower lobe showed gray hepatization. A purulent exudate could be expressed from the cut surfaces. The liver was increased in weight and showed fatty metamorphosis. The kidneys were negative save for cloudy swelling.

Examination of the head revealed marked congestion of the meninges. The subarachnoid space contained a large amount of thick, fibrino-purulent exudate. The convolutions were flattened. The ventricles were distended and contained pus. The cut surfaces of the brain appeared normal as did the large vessels at the base of the brain. The remainder of the organs were normal.

Anatomical Diagnoses: Lobar pneumonia, pneumococcus Type VII, pneumococcic meningitis, fatty metamorphosis of the liver.

Discussion

Dr. Frank C. Andrus: Microscopic sections of the lungs reveal characteristic changes of gray hepatization. The air sacs are filled with fibrin, pus cells, and pneumococci. The exudate compresses the capillaries producing a local anemia, thus giving the gray appearance. Sections of the meninges show a similar type of exudate. Due to the fibrin content, the exudate is very thick. I believe that it is reasonable to assume that this exudate had difficulty in passing from the ventri-

cles into the subarachnoid space, thus interfering with the escape of spinal fluid and producing the hydrocephalus and flattening of the convolutions. Sections of the liver show an increase in the amount of fat which has collected into droplets within the liver cord cells. This is the most common change we see in chronic alcoholics. It rarely produces any discernible interference with liver function except perhaps that related to the manufacture of antibodies. It is well recognized that individuals having fatty livers possess a markedly reduced resistance to infectious disease, particularly to pneumonia.

Dr. Martin S. Buehler: In 1940 Neal reported thirty cases of pneumococcic meningitis treated with sulfapyridine and serum where available; ten of these recovered (three died within twenty-four hours after admission). There were ten positive blood cultures with six deaths and ten negative blood cultures with five deaths. The question was raised as to whether bacteremia could be considered as a necessary or causative factor. There was a focus in the ear or mastoid in seventeen of the thirty. The method of treatment consisted in the use of 2 per cent sodium sulfapyridine intrathecally (10 to 15 c.c.) after drainage, together with specific serum. Sodium sulfapyridine intravenously was also considered a good method of treatment. Specific serum intrathecally, 10,000 to 20,000 units with each spinal drainage, and 100,000 to 300,000 units intravenously was also used in some cases.

Coleman reported his experience with pneumococcic meningitis since the advent of sulfapyridine. He collected twenty-seven cases from the literature with nine fatalities. Sulfapyridine reduced the mortality from 100 per cent to 35 per cent and he concluded that specific serum was probably of no value. He also stated that, if the patient was going to recover, he would show signs of improvement within the first three or four days and that once improvement is noted, the patient will nearly always recover. The consensus of opinion in the literature is that the best prognosis in pneumococcic meningitis is found when the meningitis is primary, the prognosis being poorer when it is associated with a pneumomoccic endocarditis or a massive consolidation.

Rhoads collected twenty-two patients with seven recoveries during a twenty months' period at the Cook County Hospital. Positive blood cultures were obtained in at least 50 per cent of the cases. His patients were treated with sulfapyridine or sulfanilamide administered early and in large doses along with specific serum up to as much as 600,000 units per day. During a three year period at the Cook County Hospital there were seventy-one cases of pneumococcic meningitis, 158 cases of tuberculous meningitis, 105 meningococcic, and 36 hemolytic streptococcic meningitis. Any type of pneumococcus can be the cause of meningitis.

Three main methods of treatment are used at the present time:

1. The most commonly used method is that of Finland at the Boston City Hospital. He gives sodium sulfapyridine intravenously until the spinal fluid level is 10 to 15 mg. per cent, which corresponds to blood levels of 15 to 20 mg. per cent, together with type specific serum intravenously up to 300,000 units or more. The sulfapyridine should be given intravenously daily during the acute stages. After the initial dose of intravenous serum, blood is withdrawn, allowed to clot, and the serum is then injected intrathecally after the removal of an appropriate amount of spinal fluid. This should be repeated daily until the spinal fluid remains sterile. We are thus injecting fresh human complement and antibodies directly into the spinal canal. The sulfapyridine should be continued for several days after the spinal fluid becomes sterile in order to prevent relapses.

2. After Flippant and Lockwood, Philadelphia General Hospital: Sulfapyridine orally and intravenously to maintain a constant blood concentration over 8 mg. per cent along with immune serum given intravenously.

3. Neal, Applebaum, and Jackson, New York City Department of Health: Intrathecal sodium sulfapyridine plus immune serum used intravenously in amounts of 100,000 to 300,000 units. Sulfapyridine should also be given orally. Ten to fifteen c.c. of 2 per cent solution of sodium sulfapyridine is mixed with 10,000 to 20,000 units of immune rabbit serum and injected intrathecally after each lumbar drainage. They do not believe that this concentration of sodium sulpyridine will irritate or injure the meninges. We believe that there is some danger in administrating sodium sulfathiazole intrathecally.

Chemotherapy in Pneumonia

Methods of Administration: 1. Oral: Four grams as an initial dose followed by one gram every four hours until the temperature has remained normal for forty-eight hours, then continuing the drug approximately one gram every six hours for an additional twenty-four hours of normal temperature. The criterion of adequate dosage being the blood level, 4 to 6 mg. per 100 c.c.

2. Our present routine: 500 to 1000 c.c. of normal saline intravenously followed by 2 grams of the sodium salt dissolved in 100 c.c. of distilled water and then continuing with 1 gram of the drug every four hours by mouth in the same manner as mentioned under oral treatment.

3. Subcutaneous therapy: .3 to .7 per cent solutions of the sodium salts have been reported in the literature as being a satisfactory method but we have had no experience with it.

4. Rectal: Used as a 2 per cent solution of the drug. This is a poor method.

5. Intravenous: 500 to 1000 c.c. of normal saline intravenously followed by 2 grams of the sodium salt intravenously dissolved in 100 c.c. of distilled water and followed by 1 gram of the sodium salt intravenously every four to six hours as long as necessary.

6. Intrathecal: 10 to 15 c.c. of 2 per cent solution of the sodium salt is injected after the removal of a slightly larger quantity of spinal fluid. Whether this method should be used is still a debatable question.

I also wish to report our series of 233 cases of nonselected, routine, consecutive admissions of pneumonia patients to the Medical Service of the Minneapolis General Hospital between October 1, 1939, and April 1, 1941, in all of whom a specific pneumococcic type was obtained before therapy was instituted. The diagnosis was confirmed by x-ray and the patients were treated alternately with sulfapyridine and sulfathiazole as soon as the type of the pneumococcus was determined. There were 128 (113 lobar and 15 broncho) treated with sulfapyridine and 105 cases (85 lobar and 20 broncho) treated with sulfathiazole. The high incidence of lobar pneumonia in our series as contrasted with the predominance of bronchopneumonia seen in private practice during this same period can best be explained by the fact that almost all of our lobar pneumonias were easily typed whereas a considerable number of the bronchopneumonias failed to type and consequently were not included in our study. The average duration of the pneumonia before admission was about three and one-half days. Complicating conditions such as diabetes, hypertension, coronary sclerosis, heart failure, alcoholism, and senility were rather common. Fifty-

two of the 105 sulfathiazole cases fell in pneumococcic type groups one, two, three, five, and seven, whereas 69 of the 128 sulfapyridine cases fell in these same groups, the remainder being divided rather evenly among the other types. The total mortality in the sulfathiazole series was seventeen, but a number of the patients had had their pneumonia a week or more before admission or had a complicating condition which readily explained the death so that the corrected mortality could be reduced to seven patients in whom death could be considered as being due to a failure of the drug to control the pneumonia. The total mortality in the sulfapyridine series was nineteen cases; the corrected mortality twelve cases.

Toxic Reactions: In the sulfapyridine series there were fourteen patients who showed a slight drop of hemoglobin and one patient who showed a drop of 25 per cent. There were three patients whose leukocyte count dropped below 4,000. All recovered spontaneously. There were twelve patients whose polymorphonuclears dropped to below 50 per cent, the lowest being 25 per cent. In the sulfathiazole series, there were five who had a slight drop in hemoglobin and one a drop of 25 per cent. Four had a drop of the total leukocyte count to below 4,000, the lowest being 2,000; all of these recovered. In none of the patients in either series were the polymorphonuclears affected when the total leukocyte count dropped. There were seven patients in the sulfathiazole series whose polymorphonuclears dropped to under 50 per cent and there was one admitted with polymorphonuclears of 46 per cent who showed no further drop under eight days of treatment. Cyanosis, a decrease in hemoglobin, red blood cells, white blood cells, and polymorphonuclears were only moderate in our series but all of these should be closely watched as they may, on occasion, show a marked drop, in which case the drug should be immediately discontinued and the patient transfused.

Eighteen of the sulfapyridine patients showed microscopic hematuria; twelve had a gross hematuria (eight of these with an adequate intake and output); three developed an oliguria (under 500 c.c. per twenty-four hours). Two of them had a very poor fluid intake. One of them died in uremia with a possible sulfapyridine kidney. In the sulfathiazole series, there were nine patients who developed microscopic hematuria, three gross hematuria, one of whom had an adequate intake and output, and six who developed an oliguria, all with a poor intake and one of whom died with a possible sulfathiazole kidney. There were no cases of anuria, drug fever, or dermatitis in the sulfapyridine series. One patient in the sulfathiazole series developed anuria; she had a very poor fluid intake. She recovered after cystoscopy and irrigation of the kidney pelves removed several grams of the drug from each kidney. There were four instances of dermatitis, three associated with a drug fever in the sulfathiazole series. Gross hematuria was three to four times as frequent with sulfapyridine, even in the presence of an adequate fluid output. This is usually an indication for stopping the drug. Urine output should be closely watched and maintained at 1200 c.c. or more per day. If this is done, there will, as a rule, be no gross hematuria with either sulfapyridine or sulfathiazole. The urine should be checked every two days microscopically for red cells as this may be a warning signal.

Oliguria and anuria may occur even in the presence of an adequate fluid intake and the urinary output must therefore be carefully checked. If the output falls too low, the drug should be stopped and the fluids forced. On occasion, it may be necessary to irrigate the ureters and renal pelves in order to wash out the crystals of the drug and prevent an obstructive uremia. Sulfapyridine may precipitate in the kidney tubules while sulfathiazole usually blocks at the uretero-vesical junction but may also precipitate in and block the tubules. Sulfapyridine may form rather firm, non-opaque stones, composed mainly of the acetylated derivative, while sulfathiazole usually remains in the form of crystals of free sulfathiazole.

Dermatitis occurred in our patients only with sulfathiazole and it is reported as being much more common with sulfathiazole than with any of the other sulfonamids. This reaction should be closely watched for and the drug stopped at once if any skin rash appears, as it may be the forerunner of a more serious toxic reaction. The dermatitis usually occurs on the fifth to the ninth day and may be of almost any type. It is frequently associated with a rather sudden elevation of temperature (drug fever).

Sixty-seven of the 128 sulfapyridine patients developed some nausea and vomiting. In twenty-seven it was more marked and in three so severe that the drug had to be stopped orally. Twenty-one of the 105 sulfathiazole patients experienced nausea and vomiting; in six of them it was marked but in no case was it necessary to stop the drug orally. Sulfapyridine produced much more nausea and vomiting, resulting in the loss of the drug in the vomitus. In only a very few of our patients were we unable to control this by sedation, delaying the dose one hour, amphojel preceding the drug, or by mixing the drug with some well liked and tolerated food, such as jello or orange juice. Often one may see severe nausea and vomiting at first and then, within a day or two, the patient will become tolerant of the drug.

Pneumonia Sequelæ: Cecil reports empyema to be the most frequent complication of pneumonia. In our series, only two patients developed empyema, both of whom had been treated with sulfapyridine; both recovered following rib resection. Pleurisy with effusion is the next most common sequelæ. There were six in our series treated with each drug; eleven of these were sterile effusions. The one showing pneumococci in the fluid expired. We had one case of meningitis, cited above. It was surprising to note that we had but seven bacteremias, six of which occurred in the sulfapyridine series with two deaths.

Summary

All pneumonias should be typed if possible so that specific serum can be given if necessary. Pharyngeal aspirations, gastric expressions, or mouse inoculations may be necessary in order to type the penumococci.

Blood cultures should be taken routinely. If strongly positive or if three or more lobes are involved by the pneumonia, intravenous therapy with the sodium salt is advisable with the addition of specific serum.

If the temperature curve fails to show a definite downward tendency within twenty-four hours, the blood level of the drug should be checked as it may be too low either from poor absorption or marked acetylization. If low, the amount of the drug should be increased in its oral dosage; an intravenous dose or two may be given; or specific serum may be desirable.

Blood levels of the drug should be checked frequently so that if low more of the drug can be given, or if too high (where there may be an increased incidence of toxic reactions), the dosage may be decreased. The optimum blood level for pneumonia is 4 to 6 mg. per cent.

Sulfathiazole does not pass from the blood into the serous cavities and spinal fluid as well as does sulfapyridine, so that the latter is the drug of choice in such cases (as meningitis).

Sulfathiazole is the drug of choice in postoperative patients where it is desirable to avoid vomiting.

Obstetrical and alcoholic cases, because of their higher mortality, are treated best by a combination of specific serum and sulfonamid drugs.

The fluid intake should be about 3,000 c.c. per day or sufficient to maintain an output of at least 1,200 c.c. per day in order to reduce the danger of renal damage or obstruction. Intravenous or subcutaneous fluids may be necessary in order to accomplish this. Consequently, the fluid intake and output should be charted so that they may be closely observed.

The sulfonamide derivatives may be used in patients having heart failure and a diuresis forced by the use of mercurial or xanthin diuretics.

The urine should be closely observed every day, not only regarding output but also for gross hematuria. Sulfathiazole often precipitates out in the urine forming a milky solution but there is little danger so long as the urinary output remains adequate. The urine should also be checked every two days for microscopic hematuria, which may be the forerunner of a serious toxic reaction.

The hemoglobin, leukocytes count and polymorphonuclears should also be checked every two days.

Intravenous therapy with the sodium salts is the procedure of choice in the very severe cases or in those with a low blood level either from poor absorption or loss by vomiting. When these drugs are given intravenously, it is best to use 2 grams for the first dose and then 1 gram approximately every four hours intravenously (for as long as it is necessary to give the drug in this manner), in order to maintain an adequate blood level, and at the same time eliminate the very high and then very low blood levels subsequent to larger doses spaced farther apart. Intravenous solutions should not be over 3 per cent because of the very high pH.

Conclusions

We were able to notice very little difference in the therapeutic value of sulfapyridine and sulfathiazole, the temperature drop and rate of recovery being very similar. There was no essential difference in the incidence of complications. There was also very little difference in the ability to reach and maintain an adequate blood level (4 to 6 mg. per cent) of the free drug.

We feel that these drugs, as of today, are a very definite advance in the treatment of pneumonia but believe that the final test of their true value will be the conquering in some year to come, of a very virulent strain of pneumococci which produces positive blood cultures.

DR. E. T. BELL: Dr. Buehler, would you recommend on the basis of this study that we use serum and chemotherapy or just the latter?

DR. BUEHLER: I would say that it is not necessary to use serum in the average case. We use the combined treatment in obstetrical patients and chronic alcoholics, and in patients who do not show a response to the chemotherapy in twenty-four hours. By that I mean, a fall in temperature during that period.

DR. BELL: Do you think, Dr. Buehler, that doctors should always determine the blood levels while administering these drugs?

DR. BUEHLER: I think that it is highly desirable and should be done whenever possible.

◆ CASE REPORT ◆

SULFAPYRIDINE IN CAPILLARY BRONCHITIS

ALDEN F. RISSER, M.D.
Stewartville, Minnesota

A girl two and one-half years old has had five attacks of capillary bronchitis, each following a mild upper respiratory infection. In each instance there were both fine and coarse moist râles throughout both lung fields, with fever and rapid respirations, and each inspiration consisted of a severe, jerky spasmodic contraction of the diaphragm. The first two attacks were quite severe, and it was necessary to administer oxygen in order to relieve the accompanying cyanosis. An X-ray of the chest during the first attack revealed no pulmonary consolidation. The attacks lasted five and four days, respectively.

The third attack was somewhat milder; at least there was no cyanosis, but on the third day of the illness there were signs of consolidation in the right upper lobe (bronchovesicular breath sounds). For this reason sulfapyridine therapy was instituted. The child was given one-half gram initially, followed by the same dose in four hours; then one-quarter gram every four hours for twenty-four hours; and then one-quarter gram every six hours for three days. Within six hours from the time of beginning the sulfapyridine, not only had the temperature become normal, but the distressing, jerky breathing had stopped, and the respirations were quiet and normal; in fact, the patient was sitting up in bed and singing. Within twenty-four hours the râles had disappeared.

Since this time the child has had two more attacks of capillary bronchitis, and each time the symptoms and signs yielded to the same treatment, within twenty-four hours.

I have also had occasion to use the same treatment in the case of a boy, three and a half years of age, who was suffering from capillary bronchitis. The result was similar; the symptoms and signs had disappeared within twenty-four hours from starting the sulfapyridine therapy.

HOMEOPATHIC AND ECLECTIC MEDICINE IN MINNESOTA*

By James Eckman

Rochester, Minnesota

(Continued from June issue)

Homeopaths in Minnesota received sectional notice in 1880, when the Western Academy of Homœopathy convened in the hall of the Minneapolis Business College at 253 Nicollet Avenue. National recognition was accorded them in 1889, when the American Institute of Homœopathy met at the Hotel Lafayette at Lake Minnetonka on June 24.

Members of the Minnesota State Homœopathic Institute were not inclined to refuse to consult "regular" physicians as a matter of practice, but "regular" physicians were not supposed to consult homeopaths. At the twenty-seventh annual session of the Minnesota State Medical Society at Duluth in 1895, Dr. Edward E. Bigelow (1841-1926) of Owatonna remarked that sixteen years previously he had been called before the board of censors of his society because he had consulted a homeopathic physician. (Dr. Bigelow was elected to membership in the Minnesota State Medical Society in 1879). He thought that the vexsome problem that had brought him such obloquy should be clarified for all time, and he proposed to clarify it by urging adoption of his resolution:

> Resolved, That it is the sense of the Minnesota State Medical Society that members thereof in the future be governed by their own judgment in meeting in professional consultation physicians of any school of medicine.[19]

Dr. Perry H. Millard (1848-1897) immediately moved that the resolution be tabled, which was done by oral vote.[19] The problem lost its importance as homeopathy declined in power, and before many years had passed there was no reason to fear that an allopathic physician would be associated with a homeopath in any professional alliance, however transitory.

Why the homeopath could not be a member of a regular medical society was explained by the *Northwestern Lancet*[20] in 1895:

> It is quite commonly supposed that the rules of what is called the old school do not allow the practice of homœopathy, hydropathy, faith cure or any of the other special methods of treatment for each of which some sect is named. This is, of course, a mistake. There is nothing in the code of the American Medical Association to prevent any member who is so disposed from treating his patients with the highest homœopathic dilutions, from invoking the aid of the mind, of faith or even of the stars if he thinks fit to help the cure. Only he must not proclaim that he treats his cases by one method only, rejecting all others. That is where the objection to the homœopath lies as a member of the regular medical society.

Innocuous as such a controversy may seem today, in the eighties and nineties it was of profound moment. It affected the practice of medicine in almost every state in the land, and was particularly vexatious in the state of New York. In February of 1882 the New York State Medical Society adopted a code of ethics

widely divergent from that of the American Medical Association.[21] Purpose of this code was to allow "regular" physicians to consult "irregular" practitioners. The action of this state society blasted opinion in the United States like a thunderbolt. All eyes were on the American Medical Association; none could doubt that a powerful challenge had been flung at the parent body. In June of that year the national body was to meet at Saint Paul. From Cambridge, Minnesota, in his eclectic journal, the *Minnesota Medical Mirror,* Dr. Nereus M. Cook[22] (1852-1927) observed cautiously:

> Let all classes of medical men recognize no code but right, and truth, and "schools" and "sects" will soon be obliterated. If the liberal spirit of the New York members is sanctioned, or the society is not reprimanded at Saint Paul at their meeting in June, the AMERICAN MEDICAL ASSOCIATION will have taken a step toward amalgamation, heretofore unknown. We shall hopefully wait to see what the day and the hour will bring forth.

As June approached, it became evident that the scheduled session of the American Medical Association at Saint Paul would be one of the most important meetings that body had had. On June 7, 1882, in Saint Paul, the Judicial Council of the American Medical Association handed down this decision:

> Having carefully considered the Code of Ethics adopted by the New York State Medical Society at its annual meeting in February, 1882 (as furnished by the secretary of said society), the Judicial Council find in said code provisions essentially different from, and in conflict with, the Code of Ethics of this Association; and therefore, in accordance with the provisions of the Ninth By-law† of the American Medical Association, they unanimously decide that said New York Medical Society is not entitled to representation by delegates in this Association.[23]

Bitterness and recrimination were the fruits of this decision, even in "regular" ranks. In Minnesota the homeopaths were especially vocative. Dr. William E. Leonard harassed the "regulars" in his *Minnesota Medical Monthly,* and Dr. Henry C. Aldrich later took up the battle in the *Minneapolis Homœopathic Magazine.* Sessions of the state institute were fiery, characterized by incredible assaults on "old school medicine."

Minnesota homeopaths were keenly sensitive to such slashing attacks as the veteran editor and lexicographer, Dr. George M. Gould[24] (1847-1922), published in his *Medical News:*

> . . . everywhere flourisheth faith-cure (that never cures); Christian science (that is unchristian and unscientific—to emesis!); the laying on of hands (that are dirty); spiritism (without spirit); spiritualism (without spirituality); Hahnemannism (either with or without the itch, the high potencies, the successions, the smelling of medicines, the divine *similia* similibus—either with or without, *comme vous-voulez!*); eclecticism (that chooses the follies); —pathies, —isms, and crankeries, that laugh at themselves and lunacies galore!

They exulted when they opened their copies of the *Hahnemannian* to read therein that Dr. Gould was "a tallow candle going out with a bad smell," "not honest," "not truthful," and that he "cringily begs for mercy."[25]

An important visitor to Minnesota and particularly Minneapolis and Saint Paul was Allen Corson Cowperthwaite, M.D., Ph.D., LL.D., F.S.Sc. (London), of Iowa City, Iowa. Once a student of the revered Constantine Hering (1800-1880), for whom a homeopathic medical college in Chicago was named in 1892, Dr. Cowperthwaite was born in 1848 and was graduated from the Hahnemann

†"No State or Local Medical Society, or other organized institution, shall be entitled to representation in this Association that has not adopted its Code of Ethics; or that has intentionally violated or disregarded any article or clause of the same."—*Transactions,* 33:629.

Medical College and Hospital of Philadelphia in 1869. In about 1878 he was elected dean of the State University of Iowa College of Homœopathic Medicine, which became extinct in 1919. He later became president of the American Institute of Homœopathy. He was much concerned with homeopathy in Minnesota, and apparently never was reluctant in extending his aid to supporters of the system in this state. Dr. Cowperthwaite was at one time editor of the *Northwestern Journal of Homœopathy,* and author of *A Textbook of Gynecology* and *A Textbook of Materia Medica.* He died of myocarditis in Los Angeles on March 1, 1926.

As the Minneapolis Homœopathic Hospital and the Minnesota Homœopathic Medical College gradually declined and merged into other institutions which themselves died out, homeopaths became less voluble, and also less numerous. Even in recent years homeopathic practitioners could be found who still clung tenaciously to the old doctrines and codices of homeopathy, but although determination was still stubborn, ranks were thinning. It is not easy to set a definite date for the extinction of a medical organization, for such groups ordinarily do not cease to exist by formal declaration. The Minnesota State Homœopathic Institute met in the fall of 1915 to hear an address by Dr. Henry C. Aldrich of Minneapolis, who had been elected president of the American Institute of Homœopathy in June of that year. In the *Journal-Lancet*[26] it was reported that the state institute met in 1923 and elected a complete slate of officers. Mrs. Glenn Matchan,[27] wife of a prominent homeopathic practitioner of Minneapolis, reported to the author that in so far as she could recall, Dr. Annah Hurd, a former secretary of the institute, placed all the papers of the organization in the hands of the Minnesota Historical Society in 1915, and that the society was dissolved in that year. Dr. Grace Lee Nute,[28] curator of manuscripts of the Minnesota Historical Society, reported to the author that "The records of the Minnesota State Homeopathic Institute were presented to the Society on October 21, 1933, and were given by Dr. Annah Hurd among the papers of her mother, Dr. Ethel E. Hurd."

In the *Journal-Lancet* of Minneapolis there are yearly allusions to the Minnesota State Homœopathic Institute to as late a year as 1923. It is possible that some sort of state homeopathic organization existed after extinction of the state institute. It may have been to such an organization that the *Journal-Lancet* referred.

Local Homeopathic Medical Societies

Union Medical Society of Minneapolis and St. Anthony.—The Union Medical Society was not a homeopathic organization. It is important to this paper only because the great homeopath of Minneapolis, William Huntington Leonard (1825-1907) was one of its founders. Ames,[29] in whose home the group which founded the society met, wrote that formation took place on June 20, 1855. He incorrectly referred to it as the "Hennepin County Medical Society," instead of the "Union Medical Society of Minneapolis and St. Anthony." Phillips[30] repeated Ames' error and perpetrated one of his own when he said that the society was founded in 1856: "The Hennepin County Medical Society was organized in 1856, a meeting for this purpose being held at the private residence of Dr. A. E. Ames . . ." Hamilton[31] clarified the obscurity surrounding the question when he demonstrated that the name "Hennepin County Medical Society" actually was assumed in March or April of 1869, the organization prior to that year having been called the "Union Medical Society of Minneapolis and St. Anthony."

When William H. Leonard helped to found the latter society in 1855 he was a so-called allopathic practitioner. He did not announce himself to be a homeo-

path until 1859 or 1860, but Hamilton[31] has shown that he was still a member of the Union Medical Society in 1862, in which year he was appointed to the Committee on Publications and the Committee on Disease of Respiratory Organs. Dr. Leonard's home at Fifth Avenue North and Second Street in Minneapolis was said to have been a favorite meeting place among members of the society, as was also Dr. A. E. Ames' house† at Fourth Street South and Eighth Avenue.[30]

Southern Minnesota Homœopathic Medical Society.—This organization had a very short existence. It was founded at Owatonna in October, 1871,[6] with Dr. J. M. (or I. M.) Westfall (1821-1889) of Rochester as president, and Dr. James Grant Gilchrist (1842-1906) of Owatonna as secretary and treasurer. In the second year of the society's existence Dr. Thomas Adams Pierce (1829-1905) of Winona was president, and Dr. Daniel Hough Roberts (1824-1910) of Owatonna was vice president and treasurer. After the meeting at Owatonna in 1871, a second meeting was held at Rochester on May 14, 1872. At the third meeting, in October, 1872, it was discovered that too few members were present to constitute a quorum; therefore, members "agreed to devote themselves to the Minnesota Institute."[6] This action presumably marked the disintegration of the pioneer medical society.

Members of the Southern Minnesota Homœopathic Medical Society, in addition to the officers previously mentioned, were Dr. Jacob M. Saunders (1816-1904) of Dodge Center, Dr. E. Cooley of Faribault, Dr. Edmund Beckwith (1836-1913) of Rochester, Dr. N. T. Williams and Dr. A. Williams of Saint Charles, Dr. Paul E. Denninger (1848-1927) of Eyota, Dr. J. Cosney of Saint Peter, Dr. E. C. Stacy of Albert Lea, Dr. Staunton B. Kendall (1808-1897) of Byron and Dr. Wilson Adolphus Allen (1834-1934) of Rochester. Dr. Cooley was one of the sixteen founders of the Minnesota State Homœopathic Institute at Saint Paul in 1867, but nothing more is known about him. The author consulted a resident of Saint Charles who had lived in the town for seventy-three years, but she could not remember either Dr. N. T. Williams or Dr. A. Williams of that village. Probably neither man was a Doctor of Medicine.

Ramsey County Homœopathic Medical Society.—This group, according to Vedder,[32] was organized in February, 1872, by Charles Draper Williams (1812-1882), Thomas Chatterton Schell (1823-1883), Edward Walther (1835-1925), James T. Alley (1831-1878), Chester Goss Higbee (1835-1908), Heinrich von Wedelstaedt (1817-1900), and C. Wiegman. Dr. Schell was elected president at the founding meeting, Dr. Walther became vice president, Dr. J. B. Hall was secretary, and Dr. Williams was treasurer. Drs. Alley, Higbee and Wiegman were censors.

Homœopathic Medical Society of Saint Paul.—This was a dissident organization, founded in 1881 by former members of the Ramsey County Homœopathic Medical Society who for some reason rebelled against the parent society.[32] It continued to exist until 1887, in which year it was merged with the parent group in the interests of harmony. In 1889 the united Ramsey County Homœopathic Medical Society had twenty-five members and held meetings monthly. In that year Edward Walther was president and Eugene L. Mann (1861-1925) was secretary.

†When members of the Union Medical Society of Minneapolis and St. Anthony met at this residence they no doubt were properly awed, for Richard B. Eide (Minnesota History, 12:391-403, 1931) has shown that the edifice, erected in 1857, had thirty rooms, a large library, elaborately ornamented ceilings, a "beautiful slab of clouded granite" in front of the doors, and a "spacious veranda supported by fluted columns."

Hahnemann Medical Society of Hennepin County.—The Hamiltons[33] said that this organization was founded on September 16, 1872, at the office of Dr. William H. Leonard (1825-1907). Constitution and by-laws of this early society were signed by Dr. David Marcus Goodwin (1833-1908), Dr. Leonard, Dr. M. H. Wallens, Dr. George F. Flanders, Dr. T. Romeyn Huntington (1829-1873) and Dr. Petrus Nelson (1847-1910). Dr. Leonard became the first president of the group, and Dr. Huntington was secretary and treasurer. Meetings were held on the first Friday of each month in the offices of Dr. Goodwin and Dr. Huntington. In 1882 Dr. William Edwin Leonard (1855-1935) reported that the society had made the *Weekly Medical Counselor* of Chicago its official journal, and that the *Counselor* had published seven of eleven papers by Hennepin County homeopaths which had been sent to it. In 1884, as secretary and treasurer of the Hahnemann Medical Society of Hennepin County, Dr. W. E. Leonard said that the membership was twenty-seven, that the *Counselor* had published three of the society's papers, and that the *Minneapolis Tribune* had published one.

Minneapolis Homœopathic Materia Medica Society.—This group was said to have been organized in 1880. It was not incorporated. Meetings were held monthly. In 1908 T. F. Smith,[34] of the American Institute of Homœopathy, reported that he had received no response from this society in either 1907 or 1908, and it may be assumed that by the aforementioned years it was defunct.

Minneapolis Homœopathic Medical Society.—The Minneapolis Homœopathic Medical Society was organized in 1880, and was not incorporated. The annual meeting of this body was held in Minneapolis on the third Tuesday of each year. In 1908 it had forty-four members, had admitted two members during the preceding year, and had lost one by death.[34]

Hahnemann Ward Association.—This association was nonmedical in purpose; it was founded, probably before 1882, by Minneapolis women interested in the establishment of a homeopathic hospital in the city.[35] At first the association provided a "Hahnemann Ward" in a rented building at Ninth Street and Eighth Avenue South in Minneapolis; later it undertook to decorate, renovate and provide free beds in the building acquired by the Minneapolis Homœopathic Hospital in 1884 at 2446 Fourth Avenue South.

Minnesota Alumni Association of Hahnemann Medical College and Hospital.—This was an organization of which the purpose was wholly social. It was formed at Saint Paul on May 24, 1887, with Dr. John A. Steele (1837-1911) of Minneapolis as president and Dr. Benjamin H. Ogden (1860-1924) of Saint Paul as permanent secretary. The association convened at sessions of the Minnesota State Homœopathic Institute. It might be observed herein that in homeopathic circles, the Hahnemann Medical College and Hospital of Philadelphia was considered to possess the greatest prestige of any homeopathic medical college of the land.

Saint Paul Clinical Society.—This homeopathic group was organized in 1887 by physicians attached to the Saint Paul Free Homœopathic Dispensary at 181½ East Seventh Street, which was opened to the public on July 18, 1887. Subsequent history of this society is not known.

Minneapolis Clinical Society.—Aldrich[36] said that physicians of the dispensary staff of the Minneapolis Homœopathic Hospital founded this society at some time

after 1880. Interest lagged, but Dr. Abner L. Bausman (1834-1911), a dentist much revered by homeopaths, revived the society in 1885, and it became known popularly as "Dr. Bausman's Clinical Society." Members met in Dr. Bausman's dental office at 242 Nicollet Avenue, and it was said that homeopaths from all parts of Minnesota attended the meetings. Out of these meetings, according to Aldrich,[36] came the demand for the *Minnesota Medical Monthly* and the Minnesota Homœopathic Medical College, both established in 1886.

Homœopathic Medical Society of Hennepin County.—Aldrich[36] said that this organization was founded in October, 1892, and that it was incorporated in July, 1893. Members met on the second and fourth Wednesday of each month at the Minneapolis Public Library. In 1893 Dr. Henry C. Aldrich (1857-1922) was secretary and treasurer of the society.

Saint Paul and Minneapolis Academy of Medicine.—In the *Medical Argus,* published at first in Kansas City, Missouri, and later in Minneapolis by Dr. Frank Fisk Casseday (1856-1932), mention is made (1891) of the "Minneapolis and Saint Paul Academy of Medicine." The academy apparently was convened alternately in Minneapolis and Saint Paul in the nineties, and may have been formed in emulation of the "regular" Minnesota Academy of Medicine, founded on October 7, 1887, at the old West Hotel in Minneapolis, as Hamilton has shown.[37]

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*References 1-18 appear in the June issue, page 479.

President' Letter

MEDICAL DEMOCRACY

A FEW weeks ago in conversation with a member of an association whose membership numbers many thousands, it was said that democracy was dead in this country, being especially noticeable in organizations of the type which we belonged to and represented.

I took issue with the statement at that time and three medical meetings which I have attended since then have convinced me more than ever that true democracy in medical circles is not dead, or even sleeping.

If "the shrine of liberty" is the "town hall," and the old fashioned caucus and conventions such as we knew in our youth were samples of true democracy, one has but to attend a meeting of the House of Delegates of the American Medical Association, the Minnesota State Medical Association, or again, a meeting of one of our up and coming county societies to see true democratic principles used in the conducting of meetings and carried out in the exchange of thoughts, to know that there is adequate hope for the survival of our democratic ideas, and that the democratic way of our fathers has not been lost.

However, there are two requisites needed to bolster up every organization: confidence in the present, and faith in the future.

The stars do not foretell a people's destiny, the hearts of men and women with self-sacrifice and courage work out the destiny of a country such as ours. Prosperity and happiness are the right of a free people; oppression, serfdom, and slavery the lot of dictator-controlled countries and societies.

If there are faults in our present political and medical setups, is it not better, rather than discard the present systems in their entirety, that we remedy some of their faults and make our present systems more workable?

In the next month the membership will have an opportunity to attend many district and special medical meetings. It is well for us to go to them with open minds tuned to the times in which we live and with a steadfast sense of responsibility for the success of each endeavor. As we give of ourselves, so will we receive.

There are no self-appointed dictators in national or state medical associations, that I know of. The strength of each lies in an active membership, not in one or two persons. Feel and see the obligation of your attendance by active participation in their deliberations.

B. J. Branton, M.D., *President*
Minnesota State Medical Ass'n

EDITORIAL

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SULFAGUANIDINE

THE successful application of sulfanilamide and its well-known derivatives, sulfapyridine and sulfathiazole, to the treatment of infectious diseases has prompted clinical investigations with other chemically related compounds. Although it was recognized that the drugs accepted for general use had a wide range of therapeutic activity, there still remained the need for a more effective compound or compounds for the treatment of diseases of the intestinal tract. Experimental and clinical evidence now available indicates that sulfathiazole has more antibacterial activity against the colon-tyhoid-dysenteriæ group of microörganisms than either sulfanilamide or sulfapyridine. However, further clinical investigations are necessary before final conclusion can be drawn concerning the therapeutic effectiveness of sulfathiazole in acute intestinal infections caused by these pathogens.

In 1940, Dr. E. K. Marshall, Jr., and his associates announced the synthesis of a compound called sulfanilylguanidine. The Council on Pharmacy and Chemistry of the American Medical Association has recommended that this compound shall be known as sulfaguanidine. Pharmacological studies with this drug revealed that it possessed an unusual type of activity in the animal body when administered by mouth. Although the solubility of the compound in water at body temperature was found to be around 200 mg. per cent, absorption from the intestinal tract was much less than was anticipated. In other words, it appeared that appreciable concentrations of the drug could be maintained within the lumen of the intestinal tract without its being absorbed in large quantities and entering the rest of the body. The antibacterial action of sulfaguanidine was also studied by the Johns Hopkins group. Appreciable activity was obtained against strains of E. coli, E. Typhi, S. dysenteriæ (Shiga), S. paradysenteriæ (Sonne, Newcastle, Flexner), and V. choleræ. Sulfaguanidine was found to be less effective against beta hemolytic streptococci, but equally as effective as sulfapyridine against pneumococci.

It was subsequently observed that sulfaguanidine could be administered safely to human beings. The amount of drug absorbed from the intestinal tract is considerably less than that obtained with the other sulfonamide compounds. At the University Hospitals, as much as 24 grams in divided doses have been given every twenty-four hours to adults. The amount of the drug absorbed was ascertained by determining the blood concentrations. Levels as high as 6 to 7 mg. per cent were obtained with these doses, but the quantities absorbed varied considerably from patient to patient. The compound appeared also as the conjugated form in the blood. The method for determining the blood concentration is the same as described for sulfanilamide. The toxic

manifestations have been few. Occasional patients have complained of nausea. Rarely has the drug provoked vomiting. Marshall and his colleagues have observed drug fever, conjunctivitis, and mild hemolytic anemia following the administration of sulfaguanidine. It is apparent that the attending physician must use the same precautions in prescribing sulfaguanidine as have been emphasized for the other sulfonamide drugs.

Preliminary clinical studies have been reported by Marshall and his group concerning the use of sulfaguanidine in the treatment of acute bacillary dysentery. The recommended doses *per os* for children are as follows: 0.10 gram per kilogram of body weight as an initial dose, and then 0.05 gram per kilogram every four hours. When the number of stools is four or less per day, the dose is reduced to 0.1 gram per kilogram every eight hours for at least three days. The dose is the same in adults except when the drug is being given every eight hours. Then the dose is 0.05 gram per kilogram instead of 0.1 gram. Each dose may be given as a powdered suspension in water or milk. The drug has also been administered satisfactorily in tablet form. Approximately 60 per cent of the patients treated at Johns Hopkins Hospital showed marked improvement within a day or two. Similar results in the treatment of bacillary dysentery have been recorded by Dr. George M. Lyon of Huntington, West Virginia.

The status of sulfaguanidine in the treatment of typhoid and paratyphoid fever is not known. The drug is also being evaluated in the therapy of chronic ulcerative colitis, but no statement concerning its efficacy can be made at this time. This also applies to chronic carriers of the typhoid bacillus, although one favorable report involving one case has been made.

The fact that sulfaguanidine reduced the number of the coliform group of organisms in the feces of the mouse when given by mouth has been applied to prophylactic procedures in human beings by surgeons at Johns Hopkins Hospital. It should be emphasized that there is no experimental evidence that the compound will render the feces sterile. Since there exists the potential danger of peritonitis occurring in patients who have had surgical resections of the large bowel due to fecal contamination, it has been recommended that sulfaguanidine should be given *per os* to these individuals for several days prior to the operation in order to reduce the number of bacteria in the fecal contents. Then if fecal contamination does take place at the time of operation, fewer bacteria will be dispersed within the peritoneal cavity. One schedule of doses used at Johns Hopkins called for 4 grams of sulfaguanidine every four hours for five days preceding the operation with the final dose being given the morning of the operation. As soon as possible after the operation, the same doses are given for five days. Another schedule has been the administration of 0.5 gram per kilogram of body weight every eight hours for seven days prior to the operation and a similar dose for seven days after.

In coöperation with Dr. O. H. Wangensteen, over twenty individuals have been prepared in this manner on the Surgical Services of the University Hospitals. In most of the patients it was impossible to administer the compound after operation because of the necessity of using suction drainage with an indwelling gastric tube. The operative procedures included resection of the colon and end to end anastomosis; the establishment of colostomies; the closure of colostomies with end to end anastomosis; and colectomies. It is exceedingly difficult to evaluate this form of prophylactic procedure. Many factors enter into the success or failure of this type of surgery. On the basis of our observations thus far, the prophylactic value of sulfaguanidine for abdominal surgery must still be established. In fact, the routine use of the drug for prophylactic purposes has been discontinued on the surgical services at the University Hospitals.

Now that sulfaguanidine has been accepted for general use by the medical profession, further evaluation in a larger number of cases is permitted. One is warranted in prescribing the compound for the treatment of acute bacillary dysentery. The results of therapy in patients with typhoid and paratyphoid fever, cholera, and chronic ulcerative colitis will be awaited with considerable interest, as well as the treatment of carriers of the typhoid bacillus. The prophylactic use of the drug in patients prior to certain operative procedures involving the large bowel remains to be evaluated.

Wesley W. Spink, M.D.
University of Minnesota Hospitals.

CONTRIBUTIONS TO THE DEVELOPMENT OF ENDOCRINOLOGY BY MINNESOTA PHYSICIANS

THE death of Sir Frederick Grant Banting recalls to mind some interesting sidelights concerning the development of endocrinology, and this in turn brings before us the part played by Minnesota physicians in its development.

All are familiar with the isolation of parathormone by Dr. A. M. Hanson of Faribault, and the studies of Dr. H. S. Plummer and Dr. E. C. Kendall concerning the thyroid gland are well known. Although in 1924 it was first suggested that patients with a certain symptom-complex might have hyperinsulinism, the first proven case, due to carcinoma of the islets of Langerhans, was that presented by Dr. R. M. Wilder and his coworkers of the Mayo Clinic. Dr. Henry Ulrich of Minneapolis, who had previously seen the patient, had suggested that an excess amount of insulin might account for the symptoms.

Concerning the discovery of insulin, Drs. Banting and Best gave credit to a paper written by a Minnesota physician for starting them on the experiments that eventually led to their success. This paper, entitled "The Relation of the Islets of Langerhans to Diabetes, with Special Reference to Cases of Pancreatic Lithiasis," published in *Surgery, Gynecology and Obstetrics,* 31:437, 1920, was written by Dr. Moses Barron of Minneapolis.

The work of Dr. A. T. Rasmussen of the Department of Anatomy, University of Minnesota Medical School, concerning the histology of the hypophysis, is well recognized, and the studies of Dr. Robert Meyer of the Department of Gynecology and Obstetrics, University of Minnesota Medical School, are of international renown.

The progress in the field of endocrinology in the past two decades has been phenomenal. While provincialism in medicine is to be decried, it is with justifiable pride that we recall these contributions to endocrinology by Minnesota physicians.

SELECTIVE SERVICE

SELECTING the young men of our country for military service, and training them in military matters for the possible or probable contingency of war, is a stupendous undertaking. That the wheels of the Selective Service organization are revolving as well as they are is a tribute to democracy, and a proof that a representative form of government can meet a national emergency with concerted action. This was proven at the time of World War I and can be repeated.

Enough draftees have been examined to furnish a rough idea of the status of young men in our country. Although the physical requirements for induction are more rigid than they were for service in World War I, the percentage of draftees accepted is said to be about the same as in 1917.

Roughly, half of those examined have been accepted for full military duty. Approximately a quarter have been recommended for limited military service, while the remaining quarter have been rejected as physically unfit. So thorough are the examinations made by the induction board in an effort to avoid the mistakes made during our last mobilization, whereby the government became responsible for defects present before enlistment, that an additional 10 per cent of those examined by the induction medical boards have been rejected.

This rejection of draftees by the induction boards proves a hardship in many instances. The draftee approved on preliminary physical examination winds up his personal affairs preparatory to service and then is rejected. This inconvenience, which is often a hardship, could be avoided if actual service was not entered upon until a certain brief period following certification by the induction board.*

The proposal to change the age group of those required to register to those twenty-one to twenty-eight, which has now been adopted, seems to be a proper move and likely to be less disrupting.

The problem of exemption and deferment is difficult to meet. It is the general opinion that all should be treated alike. Nevertheless, provision is made for exemption and deferment for certain individuals where this is to the benefit of national defense. Attention has recently been called by the Selective Service Headquarters to the importance of employers and employes coöperating with the draft boards in this matter of exemptions and deferments, not only when initial de-

*Since this was written Lt.-Col. Richard B. Hullsiek has made recommendations to National Headquarters to correct this unnecessary hardship by having final examinations made at several centers in the state, actual induction to follow several weeks later. Ed.

ferment is indicated, but when renewal of the six months' deferment is desirable from the national defense standpoint.

Certification, exemption and deferment lie in the hands of local draft boards. These boards will of necessity vary in their interpretation of the best interests of national defense. While business as usual is out of the picture, policies which will not disrupt industry more than necessary are essential.

MEDICINE'S LOSS

THE sudden death from coronary thrombosis of Mr. Jesse George Crownhart, executive secretary of the State Medical Society of Wisconsin, on June 5, 1941, while attending the annual meeting of the A.M.A. is a great loss to medicine. He had been one of the outstanding state secretaries in the country.

Mr. Crownhart was born in Superior, Wisconsin, October 8, 1896, the son of a Supreme Court Judge of Wisconsin. He graduated from the University of Wisconsin in 1921 and spent two years as a newspaper correspondent in the state legislature.

In 1923 Mr. Crownhart became executive secretary of the Wisconsin society and managing editor of the *Wisconsin Medical Journal,* which positions he held until his untimely death.

Mr. Crownhart's outstanding contribution to the medical profession was his book entitled "Sickness Insurance in Europe," written in 1938. In 1937 he had been sent to Europe by the Wisconsin State Medical Society to study governmental systems of sickness insurance and this book contained his report. The book had a wide distribution, containing as it did, an unprejudiced report of the systems of state medicine as he found them in the several countries he visited. Conclusions as to the adaptability of any of the systems to our country were rather left to the reader. The book threw much needed light on the workings of state medicine in Europe and still is a valuable piece of work.

Our sympathy goes to the profession of our neighboring state of Wisconsin.

MISCELLANEOUS

MINNESOTA DEPARTMENT OF HEALTH DIVISION OF PREVENTABLE DISEASES

Notice to Physicians Regarding Laboratory Work

Owing to reduction in state funds appropriated by the last legislature for the coming biennium, it is necessary beginning July 1, 1941, to reduce certain laboratory services offered by the Division of Preventable Diseases to physicians of the state. Careful consideration has been given by members of the State Board of Health, as well as members of our staff, as to elimination of laboratory work without injuring important services.

Changes in laboratory services beginning July 1, 1941, are as follows:

Agglutination Tests will be done on request consistent with diagnosis. Physicians are requested to fill in the diagnosis on agglutination data cards and request specific tests following this. The terms "all tests," "complete agglutination," and "complete serology," will not be interpreted as a specific request. In the absence of a definite or a tentative diagnosis, tests will not be done and blood will be held 3 days *only* for orders, as results of tests on blood held longer are not reliable.

Important: In submitting specimens for agglutination tests physicians are urged to fill out an agglutination data card. If a Wassermann test is also desired, a Wassermann data card should also be filled out and returned with the specimen in each instance. If examination is for food handlers, only typhoid and paratyphoid agglutination tests will be done. Weil-Felix tests will be done on request during tick season.

Pneumococcus Typing: Typing will be done only for the following and therapeutic serum furnished for same: Types 1, 2, 3, 4, 5, 7, 8, 14, and 19. Otherwise pneumonia service, including night service, will continue as before.

Undulant Fever: Blood cultures will be continued but animal work will be discontinued and culture work may be limited.

Miscellaneous Work: Miscellaneous tests having a lesser public health significance are to be discontinued. It is proposed to limit miscellaneous tests essentially to the following:

Blood smears to be examined for malarial parasites;

Blood smears to be examined for lead poisoning;

Blood smears to be examined for evidence of parasitic infection;

Blood cultures for typhoid and paratyphoid infection;

Stool specimens for parasites;

Various foods involved in outbreaks of food poisoning.

All other laboratory work will continue as before.

A. J. Chesley, M.D., *Executive Officer.*

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

NEW ISSUES: 1941

The changing social and economic picture in Minnesota is clearly indicated in shifting discussions of delegates and members of the Council in their annual deliberations.

Once the major subject of discussion was relief, or, as it used to be known, "care of the indigent."

Now the problem of relief, while acute in some scattered local areas, is on the way to satisfactory solution all over the state. Proper machinery for handling the problem has been set up and is functioning and it may be relied upon to find a workable solution for difficulties as they arise.

Former issues such as the much debated question of who should be responsible for medical expense for the needy poor have been settled by law as well as precedent. Also the issue involved in free choice of physician for the indigent or relief patient. Free choice is now established in the law, fortified by opinions from the attorney general and intrenched in regulations from the Division of Social Welfare.

If actual practice in some localities has not yet caught up to the law and regulations, time will undoubtedly correct the situation unless the normal evolution in such matters is upset by some radical social convulsion.

Weighing New Forms

The problems which now confront the physician in his social rôle have shifted to an earnest effort to provide adequate medical service to the armed forces and also to the civilian population; to deal with health problems revealed by the first mass examination of young men since 1917 in the United States; to weigh new forms of practice, especially prepayment plans for medical service, in the light of the established principles of sound medical practice and adapt all that may suit the purpose of a more equitable and extensive distribution of adequate medical services, particularly to low income groups; to continue to cope with disciplinary matters within the profession; to extend by demonstration and community programs, medically sponsored, certain established public health and disease control measures which promise large civic returns in terms not only of lives saved but of public funds conserved. Finally, to promote, by means of the National Physicians Committee nationally and by medical society effort, locally, a general public understanding of the facts in connection with the values and the methods and achievements of American Medicine.

Discussed by Delegates

Delegates and members of the Council discussed these new issues exhaustively in a series of sessions, took definitive action on some, continued studies on others.

Following is a brief résumé of Council deliberations. It will be supplemented in an early issue by the complete proceedings of the House of Delegates of the association.

Farm Security Plans

Two of the three counties selected for possible experimentation with the Farm Security Administration's coöperative plan for medical service to clients will give the project a one-year trial. They are Morrison and Ottertail counties. Itasca county physicians considered the plan and refused to accept it on any basis.

This plan which varies in detail from locality to locality provides in general for a pool of federal funds appropriated to farm security clients out of which costs of medical service will be paid. The experiment has the approval of the Council and the Committee on Low Income and Indigent Problems and will be watched with interest by all rural communities in Minnesota.

Industrial Medicine

Approved for submission to the Editing and Publishing Committee was the suggestion made by Chairman J. L. McLeod of Grand Rapids of the Committee on Industrial Hygiene, that space be set aside in MINNESOTA MEDICINE for publication of pertinent new material on the various new aspects of industrial hygiene. With the development of industrial aspects of the defense program, industrial medicine will become more and more important to all physicians.

Tuberculosis Control

Progress to date on the Meeker county tuberculosis control experiment, already launched by the Committee on Tuberculosis, was reported and approved. Two cases of active tuberculosis have already been discovered in patients who submitted themselves to the tuberculin skin test, voluntarily, as part of the project. One is a 16-year-old girl who showed no clinical symptoms of disease. The other is an elderly farmer suffering from an active infectious form of the disease.

Costs for this experiment, other than for medical service which is being contributed by Meeker county physicians, are being borne by the state association.

Blindness Survey

Prevention of blindness is an objective of the Committee on Ophthalmology as well as of the Society for the Prevention of Blindness. Both will participate in a survey of blindness in Minnesota to be conducted under auspices of the society and Dr. F. E. Burch of St. Paul, officer and organizer. The proposal for the survey was submitted to the Council and approved. Thus an active effort to control conditions leading to blindness is added to a large series of comparable programs initiated or sponsored by the doctors of Minnesota. The list includes tuberculosis, vaccination and immunization, conservation of hearing, reduction of maternal and infant deaths, early diagnosis of cancer, control of diabetes.

Political Coroners

One of the major political scandals among urban communities has been the conversion of the office of coroner to political purposes and the incompetence of many of the politicians who have occupied the office. The need for standard qualifications for the office was brought to the Council last year and referred to the Committee on State Health Relations. The committee was commended for its active interest in the matter and instructed to be ready at the next meeting of the Council to make its report.

Association History

Plans for publication of the history of the association which has been appearing serially in MINNESOTA MEDICINE were discussed and the dates to be covered by volume number I set. This volume will cover the history of the organization and of medicine in general in the state from pioneer days to 1900. A deadline of January 1, 1942, was set for submission of historical material from the county and district medical societies designed for this first volume. The historical committee was instructed to get in touch directly with all societies in the coming months to stimulate their interest in the work and see that all outstanding material is collected and prepared. Approximate estimates of costs are to be ready for report at the next Council meeting.

Dues

One of the knottiest problems forced upon medical organizations by the departure for active duty of medical reserve officers, particularly of young officers in the grades of lieutenant and captain, has been the question of payment of dues.

It is recognized that a large majority of these officers are willing and glad to pay medical society dues continuously because of the importance of maintaining organization work and their standing in their own societies. Likewise membership carries with it special privileges wherever they may be stationed. It is also recognized that some young physicians who have recently entered practice and who are called to duty in the lower grades of commissions, may have difficulty in keeping up payment of dues. For these it was provisionally decided last December, pending full discussion by the House of Delegates and Council, that county societies should undertake payment either out of society funds or by special assessment upon members. All but a few societies concurred in this suggestion pending final action at this meeting.

Discussions were frank and unlimited and the resolution passed by the delegates was submitted for approval and final action by the council.

The result of this joint action has already been sent to secretaries of all societies for their guidance.

Briefly, it provides that dues should be paid for physicians called to military service in the grades of captain and lieutenant by their component societies, but that societies whose finances are seriously limited and who need help in discharging the obligation may apply to the council for assistance from state association funds.

The reasons behind this action are obvious. These are critical times for medicine, and not the less so because public attention appears to be focused upon defense preparations rather than internal social "reform." It is essential that all phases of the state association program continue, especially its educational program and the program of its Committee on Public Policy. Otherwise the men who are going into service now cannot be assured of satisfactory and sound conditions of work in their profession when they return. Also the public must be protected from precipitate and thoughtless withdrawal of essential freedoms in medical service in the name of defense and national security.

New Chairman

Election of Chairman H. Z. Giffin of Rochester to the office of president-elect left the post of chairman of the Council vacant at this session. To this important post, Dr. W. L. Burnap, long a member of the Council, a former president and delegate to the American Medical Association, was elected at this session.

The office carries with it grave responsibilities for interim direction of policies and finances of the organization and the faithful, enlightened and conscientious service of Dr. Giffin over his three-year term of office was rewarded with a resolution of appreciation and thanks by the Council. Hope was expressed that Dr. Giffin would remain in close association with the Council, in spite of the fact that his election to another office has automatically canceled tenure on any other office for the period of his service as president.

Distinguished Service

A resolution of appreciation and regret for the departure of another active member of the Council was voted to Dr. C. A. Stewart who left in June to accept the chair of pediatrics at the University of Louisiana. This resolution confined itself to the distinguished services given by Dr. Stewart to the state association for many years and especially to his service on the Council, which was termed by fellow members to have been invaluable because of his wide knowledge, thoughtfulness and fairness in all matters.

Dr. L. A. Buie of Rochester succeeds Dr. Giffin as councilor of the first district and Dr. S. H. Baxter of Minneapolis succeeds Dr. Stewart in the sixth district.

REPORT OF THE MINNESOTA DELEGATES TO THE 1941 A.M.A. MEETING AT CLEVELAND

The scientific exhibits were extensive and most elaborate and one might spend the entire time of the convention studying them. Four to five movies were going on all day covering a wide variety of subjects. In the basement, below the main floor of the Auditorium, some 200 firms exhibited their goods.

The general subjects were discussed in another part of the Auditorium and the meeting places of the various sections were somewhat scattered, many of them being held in small Auditorium rooms.

In the House of Delegates, 168 out of 175 were present. The personnel of the House comprises not only representatives based on state society membership, but also has one member each from Hawaii, Canal Zone, Alaska, Puerto Rico and two from the Philippines. In addition, one each from the Army, Navy and Public Health Service. Also, the following specialties have one representative each:

Practice of Medicine
Surgery, General and Abdominal
Obstetrics and Gynecology
Ophthalmology
Laryngology, Otology, Rhinology
Pediatrics
Pharmacology and Therapeutics
Pathology and Physiology
Radiology
Nervous and Mental Diseases
Dermatology and Syphilology
Preventive and Industrial Medicine and Public Health
Urology
Orthopedic Surgery
Gastro-Enterology and Proctology
Anesthesiology

These various delegates are listed to demonstrate the democratic character of the House. All

resolutions and reports are referred to appropriate Reference Committees appointed by the Speaker of the House, and the House votes on the report of the Reference Committees.

Dr. Fred Rankin of Lexington, Ky., was chosen as President Elect. The distinguished service medal was awarded to Dr. James Ewing of New York.

The A.M.A. is now ninety-five years old and numbers 119,000. The incoming president, Dr. Frank Lahey of Boston, stressed the necessity of getting the younger men interested in medical organization.

On account of the prevalence of tuberculosis among interns, the necessity of their physical examination prior to their assumption of duty was emphasized.

There was discussion about the payment to medical men for examination of draftees. This was referred to the Committee on Medical Preparedness.

The Federal Hospital construction bill at present is quiescent but may at any time be brought to life on the ground of the necessity of medical care for the migrant indigent, who in certain cases are federal and not state charges.

In a resolution presented by Michigan, the general practitioners requested recognition as an additional section but the resolution embodying this was returned to its authors. The House also rejected the request for a Certification Board for General Practitioners.

They approved the idea that the education of medical students be not interfered with, the general scheme being that those medical students subject to draft register as is customary and that their entrance into active service be then deferred until their education is completed. We must continue the training of physicians at our present level and standards.

They approved the idea of a Centralized Procurement Bureau for the Army, Navy, industrial work and civilian care.

Massachusetts has a state law about coroners and they introduced a resolution relative to autopsies. The House is to appoint a committee of three to study the relationship between medicine and the law and to set up a committee to make their findings available to state medical associations. This resolution was referred to the Board of Trustees for study.

The Judicial Council emphasized the lack of uniformity among state medical associations in their classification of membership and they proposed to draw up standard specifications.

In order to have a wider geographic representation a Constitutional amendment was proposed to increase the membership on the Board of Trustees from nine to eleven. This lies over one year.

Michigan introduced a resolution of approval for a government hospital to be built for research and study of mental and nervous diseases, with special reference to epilepsy. The House disapproved this further encroachment on the private practice of medicine and the involved costs.

The history of the A.M.A. trial was read by Dr. Booth, chairman of the Board of Trustees, and the A.M.A. attorney, Mr. Burke, also discussed the matter and answered questions from the floor. The House approved Dr. Booth's report and voted to carry this case to the court of last resort.

The question of volunteer medical workers for foreign countries was referred to the Board of Trustees to formulate a policy.

The New York delegation sponsored a resolution for standardized tattoo on all people having serum sensitivity, the idea being if such an individual were rendered unconscious by an accident, that his attending physician might be forewarned that here was an individual who could not stand the administration of horse serum. This was not approved.

The request by the organized 8,000 women physicians for Army commissions in time of war was not approved after the Reference Committee had consulted with Army and Navy representatives. They stated it would necessitate Congressional action and would interfere with the present arrangements and is not in the best interest of the country. It was pointed out that the United States Public Health Service is open to them and that with the large number of physicians away from home, it was believed that their services could be used at home to better advantage than service with the troops.

Refugee foreign physicians are largely located in New York and are in this country in considerable numbers. The House referred this question to the Committee on Military Preparedness so that some form of work might be provided for them.

New York introduced a resolution that all

hospitals recognized for intern training should have as heads of the following departments:

Pathology
Anesthesiology
Radiology
Physical Therapy

men who hold certificates of membership issued by these various specialty boards. The House disapproved this resolution and there was a good deal of comment relative to the specialty boards. It was the opinion of the House that although originally the specialty boards were closely allied to the A.M.A. the trend has been to steadily lessen this alliance. It might be summarized by the question, Does the dog wag the tail or the tail wag the dog?

In commenting on the report of the Bureau of Medical Economics with reference to the prepayment for medical care, the House approved of the principle involved by the adoption of the following: (This is an extract from the report of the Reference Committee.)

It is recommended that the Board of Trustees take whatever steps are necessary to insure continuity of this important phase of the work of the Bureau to the end that there may be established some method of coordination and interchange of material pertinent to the administration of such plans in order that all state and county medical societies may profit thereby. It is further recommended that the House of Delegates reaffirm its belief that the principle of prepaid medical care justifies an experimental period during which time, advice and assistance be given to medical societies that elect to conduct such experiments under medical sponsorship.

A resolution was adopted to make the 1942 meeting in Atlantic City a Pan-American session and that Canada and the South American countries be invited to attend and participate in this meeting.

The House also recommended that the Board of Trustees be asked to establish a commission on Pan-American relations to advise on the various problems of Pan-American import.

W. A. Coventry, M.D.
A. W. Adson, M.D.
J. M. Hayes, M.D.
F. J. Savage, M.D.

NEW CLASSIFICATION

At the request of the War Department, questionnaires were sent to all state association offices recently, requesting that every physician in the state be classified by their county and district secretaries, according to whether or not he could be spared from home communities for military service.

The difficulties involved in such an appraisal were obvious and protests were made by many states including Minnesota. At the direction of the Council, action on the request was held up until further instruction could be secured at the American Medical Association meeting.

Final instructions are simpler and less objectionable. They call for classification according to age. Every secretary of a component society has already been asked to separate the physicians in his county or district according to whether they are fifty-five years old or older. These questionnaires were sent to the secretaries in June and should be returned promptly to the state office.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Saint Paul Woman Given Four-Year Term for Abortion

Re: State of Minnesota vs. Grace Burke alias Billie Burke, whose true name is Theresa Agnes Burke.

On May 28, 1941, Mrs. Theresa Burke, 51-year-old St. Paul divorcee, was sentenced to a term of not to exceed 4 years at hard labor in the Women's Reformatory at Shakopee by the Hon. Hugo O. Hanft, Judge of the Ramsey County District Court, after the defendant had entered a plea of guilty to the crime of abortion.



Theresa Agnes Burke

Mrs. Burke was arrested by the St. Paul police department on May 14, 1941, in her apartment at 603 Minnesota St., St. Paul, following an abortion she had performed on May 10 on a 27-year-old married woman who was delivered of still-born twins at Ancker Hospital May 12. Mrs. Burke had been paid $12 for her services. Upon being questioned Mrs. Burke admitted having performed criminal abortions over a period of the past 9 years, most of them being for married women. The defendant has had no medical or nursing training and holds no license of any kind in the healing arts. She stated she formerly worked as a corsetière.

This case is the fourth successful prosecution in St. Paul in the past month and is conclusive evidence of the splendid work and coöperation by the St. Paul police department and particularly Lieut. Thomas Grace and also by the office of the county attorney of Ramsey County under Mr. James F. Lynch, who has personally handled all four cases.

Saint Paul Woman Sentenced to Eight-Year Term for Abortion! Assistant Placed on Probation for Two Years

Re: State of Minnesota vs. Georgiann Tennyson, also known as Ann Tennyson.
Re: State of Minnesota vs. Emma Redder.

On May 23, 1941, Mrs. Georgiann Tennyson, 52 years of age, was sentenced by the Hon. Hugo O. Hanft, Judge of the District Court of Ramsey County, to a term of not less than 2, and not more than 8, years at hard labor in the Women's Reformatory at Shakopee, following her conviction by a jury of the crime of abortion. Mrs. Tennyson received twice the regular sentence because of the fact that she had a previous conviction in 1928, for a similar offense.



Georgiann Tennyson



Emma Redder

Mrs. Tennyson was arrested on May 7, 1941, along with the defendant, Mrs. Redder, following an investigation by the St. Paul Police Department and the Ramsey County Attorney's office into the circumstances leading up to the abandonment of a 6-day-old baby on the doorstep of Salvation Army's Booth Memorial Hospital in St. Paul. The investigation disclosed that the mother of that child had gone to Mrs. Redder about March 20, 1941, to have an abortion performed and Mrs. Redder had taken the mother to Mrs. Tennyson. Mrs. Tennyson attempted to perform a criminal abortion, but it was unsuccessful. Thereafter the mother consulted Peter J. Stolurow, who operated an orthopedic shoe store at 16 W. 6th St., St. Paul. Stolurow was also arrested for practicing healing without a basic science certificate and for abandoning a child at the Salvation Army Hospital.

Mrs. Redder, who is 48 years of age, entered a plea of guilty on May 12, 1941, to an information charging her with the crime of attempted abortion, and testified for the State as a witness against Mrs. Tennyson. Following Mrs. Tennyson's conviction and sentence, Mrs. Redder was sentenced by the Court to a term of not to exceed 2 years in the Women's Reformatory in Shakopee, but her sentence was suspended and she was placed on probation.

The Minnesota State Board of Medical Examiners wishes to commend the work done by the St. Paul Police Department and the County Attorney's office of Ramsey County in these cases. The defendants Tennyson and Stolurow are old offenders and neither of them has any respect for the laws of the State of Minnesota. Mrs. Redder undoubtedly deserved some consideration because of the fact that she testified for the State and did what she could to coöperate in making the facts known.

Self-Styled Health Expert Found Not Guilty by Jury

Re: State of Minnesota vs. Russell James.

On June 10, 1941, a jury in the District Court of Hennepin County returned a verdict of not guilty in the trial of Russell James, 50 years old, of Glendale, California, who was on trial on an information charging him with practicing healing without a basic science certificate. James was arrested on May 27, 1941, at the Wesley Temple Gymnasium, where he had been giving so-called free health lectures since May 12, 1941. In connection with his health lectures, which were free to the extent that a collection was taken up at each lecture, various so-called food products and diet lists were recommended for certain ailments including arthritis, rheumatism, thyroid trouble, nervous spasms, diabetes, glaucoma, spots before the eyes, bladder trouble, low blood pressure, high blood pressure, thrombosis of the heart, varicose veins, colitis and numerous other ailments. These so-called food products were sold for prices ranging from 50c to $2.50, depending upon the article purchased and the amount.

At the trial James admitted that up until about 5 or 6 years ago he was a physical trainer and that he had never gone to any college and possessed no educational degree of any kind. He claimed to have learned about health from personal experience. He stated he worked for Health Science, a California corporation, and that this corporation obtained their so-called food products from the Live Food Products Co. of Burbank, California. Notwithstanding the fact that James laid great stress on the use of these products because of their vitamin content, he admitted that, of his own knowledge, he knew nothing about their content.

The Supreme Court of Minnesota has held that one who engages in such activities in the State of Minnesota is engaged in the practice of healing, and therefore needs a basic science certificate. This decision of the Supreme Court of Minnesota was followed by the trial court in James' case when it denied a motion by the defendant to dismiss the case after the State had submitted its evidence. The Minnesota authorities charged with the responsibility of investigating these cases, and with the enforcement of the healing laws of this State, intend to continue their investigation into the activities of these itinerant self-styled health experts, most of whom hail from California. If the evidence obtained indicates a violation of these laws, further prosecutions will be instituted.

License of Minneapolis Physician Revoked for Criminal Abortion

In the Matter of the Revocation of the License of Samuel R. Fraker, M.D.

On May 9, 1941, the Minnesota State Board of Medical Examiners revoked the license to practice medicine and surgery formerly held by Samuel R. Fraker, M.D., of Minneapolis. Dr. Fraker was charged with having procured, aided and abetted a criminal abrotion on a 17-year-old unmarried Minneapolis girl. Dr. Fraker pleaded guilty on February 21, 1941, in the District Court of Hennepin County to an information charging him with the crime of abortion in connection with the same case. At that time he was sentenced to a term of not to exceed 4 years in the State Prison at Stillwater and the sentence was suspended for a period of 3 years upon Dr. Fraker's plea of illness and his request that he be given an opportunity to live with his daughter in Los Angeles, California. Dr. Fraker did not contest the revocation of his license.

Dr. Fraker's license as physician was previously suspended by the Minnesota State Board of Medical Examiners on November 4, 1938, for a period of 3 years for a similar offense. Dr. Fraker was born in 1870 in Pennsylvania, and graduated from the College of Physicians and Surgeons in Baltimore, in 1904. Dr. Fraker was licensed to practice medicine in Minnesota in 1916 by reciprocity.

PHYSICIANS LICENSED MAY 9, 1941

April Examination

Ahern, Gerald Steber—U. of Minn., M.B. 1939, M.D. 1940, Mpls. Gen. Hospital, Minneapolis, Minn.

Babb, Frank Shaleen—U. of Western Ont., M.D. 1938, Mayo Clinic, Rochester, Minn.

Brownson, Bradley Claude—Tulane U., M.D. 1937, Mayo Clinic, Rochester, Minn.

Cleaves, William Donald—U. of Minn., M.B. 1940, St. Luke's Hospital, Duluth, Minn.

Crosbie, Stanley, U. of Minn., M.B. 1941, 4053 Garfield Ave. S., Minneapolis, Minn.

Crowley, Daniel Francis, Jr.—U. of Iowa, M.D. 1938, Mayo Clinic, Rochester, Minn.

Daugherty, Guy Wilson—Med. Col. of Va., M.D. 1937, Mayo Clinic, Rochester, Minn.

Fingerman, David Louis—U. of Minn., M.B. 1939, Mpls. Gen. Hospital, Minneapolis, Minn.

Foxworthy, Laurel Rae—Ind. Univ., M.D. 1939, Mayo Clinic, Rochester, Minn.

Gelbach, Philip Delmont—U. of Pa., M.D. 1939, Mayo Clinic, Rochester, Minn.

Grabow, John Jergun—Creighton U., M.D. 1938, 1820 Jefferson St., Duluth, Minn.

Graves, James Huntington—U. of Minn., M.B. 1940, Ancker Hospital, St. Paul, Minn.

Haavik, John Edward Thue—U. of Minn., M.B. 1940, Ancker Hospital, St. Paul, Minn.

Hall, Wendell Howard—U. of Minn., M.B. 1940, 224 W. 52nd St., Minneapolis, Minn.

Hallberg, Olav Erik—U. of Minn., M.D. 1940; Mayo Clinic, Rochester, Minn.

Hardman, Sue Colquitt—Johns Hopkins, M.D. 1938, Mayo Clinic, Rochester, Minn.

Haserick, John Roger—U. of Minn. M.B., 1940, Ancker Hospital, St. Paul, Minn.

Heinz, Lawrence Henry—U. of Minn., M.B. 1940, St. Joseph's Hosp., St. Paul, Minn.

Hildreth, Allen Wesley—Cornell U., M.D. 1938, Mayo Clinic, Rochester, Minn.

Hilger, David William—Northwestern U., M.B. 1939, M.D. 1940, University Hospital, Minneapolis, Minn.

Hill, Allan Janney, Jr.—U. of Minn., M.B. 1939, M.D. 1940, 1408 S. E. 5th St., Minneapolis, Minn.

Hollenhorst, Robert Wm.—U. of Minn., M.B. 1940, Ancker Hospital, St. Paul, Minn.

Hopping, Richard Arundel—Long Island Col. of Med., M.D. 1939, Mayo Clinic, Rochester, Minn.

Jones, Reverdy Hamlin, Jr.—U. of Va., M.D. 1938, Mayo Clinic, Rochester, Minn.

Kaplan, Jack—U. of Minn., M.B. 1939, M.D. 1939, 1933 Fremont Ave. S., Minneapolis, Minn.

Kloos, Edward Karl—U. of Rochester, M.D. 1938, Mayo Clinic, Rochester, Minn.

LaBree, John William—U. of Minn., M.B. 1940, Ancker Hospital, St. Paul, Minn.

Lannin, Donald Rowe—U. of Minn., M.B., 1940, St. Luke's Hospital, Duluth, Minn.

Levinson, Julian Paul—Washington U., Mo., M.D. 1937, Mayo Clinic, Rochester, Minn.

Lundgren, Olive Anga—U. of Minn., M.B. 1940, 1607 Lowry Ave. N.E., Minneapolis, Minn.

MacArthur, W. J. Campbell—McGill U., M.D. 1938, Mayo Clinic, Rochester, Minn.

MacKenzie, Ralph William—U. of Minn., M.B. 1940, 104 N. Miss. River Blvd., St. Paul, Minn.

Manlove, Francis Roxby—Temple U., M.D., 1938, Mayo Clinic, Rochester, Minn.

Marsh, Otis Milton—U. of Minn., M.B. 1940, Mpls. Gen. Hospital, Minneapolis, Minn.

Martin, Ann Lavinia—Cornell U., M.D. 1938, University Hospital, Minneapolis, Minn.

Marvin, Charles Peterson—U. of Minn., M.B. 1940, Ancker Hospital, St. Paul, Minn.

McEachern, Cecil Gray—U. of Western Ont., M.D. 1937, Mayo Clinic, Rochester, Minn.

McCuistion, Columbus Hal, Jr.—U. of Texas, M.D. 1938, Mayo Clinic, Rochester, Minn.

McKay, Donald Richard—Northwestern, M.B. 1940, Ancker Hospital, St. Paul, Minn.

Mears, Fredrick Blackburn—U. of Rochester, M.D. 1939, University Hospital, Minneapolis, Minn.

Movius, William Robert—Northwestern, M.B. 1939, M.D. 1940, University Hospital, Minneapolis, Minn.

Musselman, Florence Jane—U. of Wis., M.D. 1938, University Hospital, Minneapolis, Minn.

Nauth, Bernard Spencer—U. of Minn., M.B. 1941, Winona, Minn.

Olson, Ivy Bernice—U. of Minn., M.B. 1940, Asbury Hospital, Minneapolis, Minn.

Olson, John Donald—U. of Pa., M.D. 1938, Mayo Clinic, Rochester, Minn.

Pennoyer, James, III—U. of Rochester, M.D. 1939, University Hospital, Mpls., Minn.

Petersen, Robert Thorvald—U. of Minn., M.B. 1940, M.D. 1941, 1111 Nicollet Ave., Minneapolis, Minn.

Phillips, Spencer Kleckner—Northwestern, M.B. 1939, M.D. 1940, Mayo Clinic, Rochester, Minn.

Polley, Howard Freeman—Ohio State U., M.D. 1938, Mayo Clinic, Rochester, Minn.

Poore, John Chapman—U. of Minn., M.B. 1940, Trinity Hospital, Minot, N. D.

Radcliffe, James, Jr.—Yale U., M.D. 1938, Mayo Clinic, Rochester, Minn.

Ramsay, Beatty Haig—U. of Manitoba, M.D. 1940, University Hospitals, Minneapolis, Minn.

Rizer, Dean Kirby—Harvard U., M.D. 1938, 1931 Med. Arts Bldg., Minneapolis, Minn.

Ryan, James Doyle—St. Louis U., M.D. 1940, Fairfax, Minn.

Schilla, Fredrick Wm., Jr.—U. of Minn., M.B. 1940, Milwaukee Co. Hospital, Wauwatosa, Wis.

Schmitz, Robert Lenzen—U. of Chicago, M.D. 1938, Mayo Clinic, Rochester, Minn.

Selin, Golden—U. of Minn. M.B. 1941, M.D. 1941, Glen Lake Sanatorium, Oak Terrace, Minn.

Smith, Frederick Harvey—U. of Western Ont., M.D. 1938, Mayo Clinic, Rochester, Minn.

Starekow, Milton David—Rush Med. Col., M.D. 1940, St. Joseph's Hospital, St. Paul, Minn.

Stone, Stanley Paul—U. of Minn., M.B. 1941, Ancker Hospital, St. Paul, Minn.

Swanson, Vincent Francis—Northwestern, M.B. 1938, M.D. 1939, 611 Delaware S. E., Minneapolis, Minn.

Tinney, William Scott, Jr.—U. of Pa., M.D. 1938, Mayo Clinic, Rochester, Minn.

Van Bergen, Frederick Hall—U. of Minn., M.B. 1941, R. No. 1, Hopkins, Minn.

Vines, Robert William—U. of Neb., M.D. 1937, Mayo Clinic, Rochester, Minn.

White, Raleigh R., III—Tulane U., M.D. 1939, Mayo Clinic, Rochester, Minn.

By Reciprocity

Nelson, Roy Arthur—U. of Chicago, M.D. 1939, Fergus Falls, Minn.

National Board of Credentials

Cannon, Edward E.—Rush Med. Col., M.D. 1939, Mayo Clinic, Rochester, Minn.

Wells, Gideon Robbins—Harvard U., M.D. 1938, Mayo Clinic, Rochester, Minn.

PROCEEDINGS OF THE MINNESOTA ACADEMY OF MEDICINE

Meeting of March 12, 1941

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, March 12, 1941. Dinner was served at 7 o'clock and the meeting was called to order at 8 p.m. by the President, Dr. John M. Armstrong.

There were forty members present.

Minutes of the February meeting were read and approved.

The Secretary read a letter from Dr. Archa Wilcox, presenting his resignation from the Academy. The Executive Committee recommended to the Society that Dr. Wilcox's name be placed on the Senior Membership list, and a motion was made, seconded and carried that this be done.

The scientific program followed, and consisted of a case report and a thesis.

CARDIAC MYXOMA

Simulating Subacute Bacterial Endocarditis

Max Hoffman, M.D.
Saint Paul

Benign tumors of the heart have been reported on numerous occasions. Approximately 100 cases have been described. Most of these were myxomata located in the left auricle.

Case History.—This patient was a twenty-nine-year-old female, a physician's office assistant. Six weeks before she entered the hospital she began to have pain in the tip of the little finger of the left hand. She noticed a small, red, tender area in this region. A few days later she experienced pains in the end of the left big toe; and here also was present a small, tender, red area. Later, similar lesions appeared on the soles of the feet and in several fingers. She stated that early in the illness there were pains in the finger joints and often blanching of the fingers. At one time she had considerable distress because of a severe pain with cramps in her right leg. The only symptom referable to the heart was the discomfort due to tachycardia.

The past history was of no importance. There was no history of rheumatic fever.

While in the hospital she ran a temperature of 99° to 99.2° with a pulse rate of 90 to 110 per minute. Several small petechiæ were present on the tips of the fingers and soles of the feet. These were red and tender and appeared exactly like the lesion of subacute bacterial endocarditis. The heart was not enlarged on percussion, but there was present at times a very distinct presystolic thrill and murmur. This was felt best when she was sitting up. Most of the time there was also present a systolic murmur in the apical region. On rare occasions no murmur could be made out at all. The murmurs varied greatly in their quality and intensity. At this time there was no evidence of any congestion in the lungs, and the liver and spleen were not palpable. She had no dyspnea or orthopnea.

Daily examination of urine never showed showers of red cells, although at times there would be four to eight red cells per field. The hemoglobin was 75 per cent, and the leukocyte count ranged between 8,000 and 10,000 per cubic millimeter. Several blood cultures were sterile.

Because of the changing heart findings and the presence of petechiæ, subacute bacterial endocarditis was considered as being the most likely diagnosis. The failure to secure a positive blood culture and the absence of fever cast little doubt on this diagnosis. The Libman-Saks syndrome was also considered.

She returned home and was fairly comfortable for about six months. The tachycardia still bothered her and she would at times have a little substernal pain and pressure. During this interval, there were only a few of the small, tender, red areas present.

Following what she described as an influenza she developed an acute digestive upset characterized by nausea, vomiting and diarrhea. The week after the onset of these symptoms she returned to the hospital. At this time the heart was enlarged in both directions. The varying heart murmurs were still present but not as loud. The liver was markedly enlarged, occupying most of the right abdomen and extending into the upper left abdomen. She complained a great deal about pressure in the abdomen and attempted to secure relief by kneading the lower ribs with her hands and by extending her back. There was no fluid present in the abdominal cavity. It was difficult to believe that this extremely large liver was due solely to passive congestion because of the absence of other signs of congestive heart failure.

The electrocardiogram showed a flattening of the T-wave in lead 1 and 2 and an inversion of the T in lead 4, and a marked right axis deviation was present.

At the end of two weeks she was markedly improved and was sent home. Two months later she returned with the same abdominal symptoms but complaining, also, of extreme weakness. A gastrointestinal x-ray showed the stomach and duodenum to be markedly displaced to the left. She felt fairly comfortable for about six days, and then began to complain of extreme weakness and shortness of breath which had come on rather suddenly after a good night's sleep. The heart at this time was fibrilating. She died a few hours later.

The postmortem examination by Dr. Kano Ikeda showed the following:

Necropsy Findings.—The body was that of a well developed, fairly well nourished, adult white female, 160 cm. in length and approximately 100 pounds in weight. Rigor was slight. Slight hypostasis of the dependent portions. Slight edema of the feet and ankles. No definite cyanosis or jaundice. The pupils were equal and 4 mm. in diameter. There was a right rectus scar about 9 cm. in length.

The subcutaneous adipose tissue was scanty in amount.

The peritoneal cavity contained approximately 500 c.c. of clear straw colored fluid. The liver border extended 11 cm. from the costal margin on the right side and 8 cm. from the xiphoid process in the midline. The appendix was absent. The diaphragm was at the 4th intercostal space on the right and the 5th intercostal space on the left.

Each pleural cavity was free of adhesions and contained approximately 50 c.c. of clear amber colored fluid.

The pericardial sac contained about 100 c.c. of clear straw colored fluid. It was distended.

The heart weighed 450 gms. It was globular in shape, dilated and in diastole. The epicardium was smooth. The myocardium was pale red, cloudy, swollen and soft. The mural endocardium was smooth. The valves showed no disease. The right auricle and ventricle were moderately distended. The circumference of the root of the aorta was 4 cm. The left auricle was filled with an irregular, lobulated, soft, yellowish translucent gelatinous mass, roughly 6x5x3 cm. when spread out. This was attached firmly to the posterior wall of the auricle at the lower border of the closed foramen ovale by a narrow base. The mass moved freely and obstructed the mitral orifice and orifices of the pulmonary veins. The root of the aorta showed a smooth intimal surface. The diameter of the ascending portion was approximately 1.5 cm. The coronary arteries were normal.

The right lung weighed 400 gms. The left lung weighed 350 gms. Crepitation was preserved throughout except in the dependent portions which were slightly edematous and congested. The cut surface showed the dependent portions containing a slightly increased amount of bloody frothy fluid. No areas of consolidation. The bronchi were clear. The pulmonary vessels were also clear.

The spleen weighed 200 gms. The capsule was smooth and stretched. The pulp was dark red and firm in consistency. The corpuscles and trabeculæ were insignificant.

The liver weighed 1500 gms. The capsule was smooth. The surface was bluish brown in color. The cut surface showed the parenchyma pale golden brownish yellow and the centers of the lobules were quite prominent.

The gall bladder was normal. It was distended.

The gastro-intestinal tract was normal.

The pancreas and the adrenals were normal.

The right kidney weighed 120 gms. The left kidney weighed 150 gms. The capsules stripped readily, showing smooth brownish red surfaces. The cut surface showed the markings fairly distinct. The organ was quite firm in consistency. The ureters and urinary bladder were normal.

The genital organs were normal.

The aorta showed no anomalies.

There were no enlarged lymph nodes.

The organs of the neck and head were not examined.

Diagnosis.—(1) Primary myxoma of the left auricle causing partial stenosis of the mitral orifice. (2) Dilatation of the right ventricle and auricle. (3) Chronic passive congestion of the liver, spleen and kidneys.

Microscopic examination of the tumor in the left auricle showed a lobulated surface lined with a single layer of endothelium and composed of loose, connective tissue fibers containing round, spherical and sometimes lobulated vesicular neuclei of varying sizes, in a loose semiliquid gelatinous stroma. Sometimes the fibers showed a typical appearance of branching, stellate myoma cells. Sometimes the nuclei were quite large and multinucleated. No mitotic figures. The appearance of the tumor was typical of that of myxoma.

The liver showed extreme degree of chronic passive congestion.

Discussion

Dr. C. N. Hensel, Saint Paul: I feel this very interesting case which Dr. Hoffman has presented should not be passed without some discussion and perhaps a reference to points in clinical diagnosis. As Dr. Hoffman has stated, this tumor acted as a ball valve in the mitral orifice. In cases of mitral stenosis where a thrombus is formed in the auricular cavity, this occasionally breaks loose and rolls around freely in the auricular cavity, sometimes growing to considerable size and acting exactly like a ball valve as in the case of Dr. Hoffman's attached myxomatous tumor.

While studying with Dr. Wennkebach in Vienna, I saw two cases of mitral stenosis in which the diagnosis of ball valve tumor in the left auricle was made on a peculiar facies that the patients presented. Both these patients had markedly dilated port-wine colored vessels over the malar prominence of both cheeks which could be seen across the hospital ward, as well as a very marked bulging in the x-ray silhouette of the left auricle.

From previous autopsy experience, they were able to make an ante-mortem diagnosis on the x-ray silhouette and the facies. I am wondering if this patient of Dr. Hoffman presented this peculiar type of facies.

Dr. A. M. Snell, Rochester: Did the peripheral vessels in the extremities show anything characteristic?

Dr. Moses Barron, Minneapolis: I would like to inquire about the mechanism of the enlargement of the liver in this case where the lesion was on the left side of the heart without much evidence of pulmonary congestion. Also, at the autopsy the liver weighed only 1500 grams, a weight which is entirely within normal limits, although the measurements as given were rather large.

Dr. Hoffman: This woman did not present any unusual discoloration of the face or any telangiectatic changes. We did not do a biopsy of the petechial lesions. In answer to Dr. Barron's question, I don't know why this woman had this enormous liver. In examining her at the time she had the large liver,

she did not have much evidence of passive congestion in the lungs. The liver had become quite a bit smaller before she left the hospital. When she entered the hospital again later, the liver was not as large as before. We had no evidence at any time that the auricular tumor had obstructed the pulmonary orifice.

DR. HENSEL: Did you say this tumor could shift so it could block the pulmonary veins?

DR. HOFFMAN: In some cases it does, and then they have acute dyspnea. This patient at no time had paroxysmal dyspnea which would indicate that such blockage had occurred.

Dr. Wyatt, of Minneapolis, then read his Inaugural Thesis.

INTUSSUSCEPTION IN INFANTS

O. S. WYATT, M.D.*
Clinical Assistant Professor of Surgery,
University of Minnesota
Minneapolis, Minnesota

Acute intussusception is looked upon as the outstanding dramatic incident which can occur within the abdomen of the infant. Curiously enough it usually happens to the well nourished and perfectly healthy baby. It strikes like "lightning out of a clear sky" and if not diagnosed early, and relieved, practically always ends in death.

I offer no apologies for again calling this subject to your attention, because the condition must always be kept fresh in our minds if we are to lower the mortality of this disease.

Intussusception is nearly always descending in character, although a few instances of the ascending type have been reported. The intussusception is usually single, occasionally is double, and rarely may be triple. Multiple intussusceptions are very rare. The invaginating portion of the intussusception is called the intussusceptum; the ensheathing portion, the intussuscipiens. The head is the most distal portion of the intussusceptum and the neck is the most proximal portion of the intussuscipiens.

The etiology of this condition is not at all clear, but several interesting theories have been advanced. Some observers believe that if the ascending colon and cecum retain their embryonic mesentery, resulting in a mobile cecum, the potential factor for an intussusception is present. Others feel that there may be some disturbance in the neuromuscular mechanism, producing improper peristalsis.

Perrin and Lindsay, reporting on over 400 cases, advance the theory that stimulation of some character results in hypertrophy of the normally abundant lymphoid tissue in the terminal inch or two of the ileum. This results in the ileocecal valve protruding still farther into the cecum. The mass, as a whole, then acts as a foreign body, the intestinal tract by hyperperistalsis tries to expel it, and the result is an intussusception. The fact that intussusception nearly always occurs in well nourished infants, and those tending to be fat, lends support of this theory. Likewise the condition is rarely observed in poorly nourished babies or during epidemics of diarrhea. This, I believe, is the most rational theory that has been advanced regarding the etiology of intussusception.

Of course the presence of a tumor, hemorrhage, or diverticulum in the bowel wall may be the initiating factor for an intussusception. Occasionally the appendix may be the exciting agent.

Clinically all acute intussusceptions of infants can be divided into three types: (1) enterocolic; (2) enteric; (3) colic.

Any further differentiation is merely of academic interest. The name of each type is self-explanatory, but a few words regarding the frequency of the different types may be appropriate.

About 85 per cent of all intussusceptions are enterocolic in nature. This fact lends itself well to the theory advanced by Lindsay and Perrin. Probably 10 per cent of intussusceptions are enteric in type, and when such an intussusception is encountered search must be made for a predisposing cause. This may be a Meckel's diverticulum, a tumor of the intestinal wall, or a hemorrhage such as may occur in Henoch's purpura or hemophilia. Pathologic changes in the bowel wall may account for colic intussusception. However, this type is rare, occurring in only 3 to 5 per cent of cases.

The large majority (perhaps 85 per cent) of acute attacks occur in children under two years of age. Seventy per cent of cases occur in the first year of life, and fully 50 per cent of these take place between the seventh and eleventh months. Thus it is very apparent that we are dealing primarily with a disease peculiar to infants.

In intussusception the first and most important changes take place in the blood vessels. The mesentery undergoes tremendous stretching and the vessels become occluded. The veins are the first to be affected and the intussusceptum becomes edematous and swollen. If the intussusception is not reduced at this stage of its development the increasing pressure shuts off the arterial blood supply resulting in gangrene and necrosis of the invaginated bowel. During these pathological changes obstruction takes place, due to mechanical factors, and paralysis of the involved gut.

The mother, upon being carefully questioned, will give about the following history: Her perfectly healthy, well-nourished baby is suddenly seized with severe abdominal pain. Most mothers know exactly the time that this episode started, and are likewise aware that this pain is different from any colic which her baby ever had. During the attack the infant screams out, becomes pale, perspires freely, and in many instances presents the picture of shock.

If the infant is not in too severe shock he will frequently assume the knee-chest position during the attack of pain. Rodda feels that this is a very significant sign. Within a few seconds to a few minutes the pain passes away and the baby looks and acts normally.

A similar attack recurs in three to fifteen minutes and the victim goes through the same maneuver. The attacks of pain recur with a definite rhythm, and in

*Attending Pediatric Surgeon Minneapolis General Hospital.

many instances an intelligent mother will remark that they simulate labor pains. During the first couple of seizures the infant may have a normal bowel movement. This is an evacuation of the rectal contents, but because it is normal, do not be deceived. The infant may vomit during the first attack or two, but early in this disease vomiting is not an outstanding symptom.

The shock phenomenon in intussusception presents an interesting study. Some infants will go into shock with the first attack of pain and never come out of it until the intussusception has been reduced. This type, I believe, represents the tight, severe, intussusception which can never be reduced by other than surgical means. Barium enemata may help in the diagnosis of this case but it will not be of any therapeutic value. Occasionally you will see an infant go into shock with the first few attacks of pain and within an hour or two come out of it. He will present good color, lie in bed sucking his fingers, perfectly happy, and not having any abdominal pain. Don't be misled by this picture and lulled into a state of false security. This baby still has an intussusception and the usual careful examination will reveal the tender mass. I do not believe that this intussusception can be reduced by a barium enema but of necessity requires surgical intervention.

On the other hand many babies will develop a so-called mild or loose intussusception and never present any evidence of shock. I imagine this is the type of case which, if seen within six to eight hours, can occasionally be reduced by a barium enema. This is usually the enterocolic type of intussusception and the absence of shock is probably due to the fact that the colon is primarily involved and very little ileum is involved. I feel that if we will study the shock pictures more carefully we will be able to tell if the barium method of reduction should or should not be attempted.

If seen within the first few hours the abdomen is normal in appearance and soft on palpation. In palpating the abdomen, you are of course trying to feel a mass. Several times in palpating the right lower quadrant I have been impressed with its emptiness. This sign, the French tell us, is characteristic of enterocolic intussusception. The sausage-shaped tumor for which you are searching is usually felt in the right upper quadrant or along the transverse colon above the umbilicus. Occasionally it may be found in the region of the splenic flexure or along the descending colon. The location of the tumor may vary between examinations. The shifting of the mass is due to the fact that the cecum and ascending colon have retained their embryonic mesentery, and therefore permit mobility of this portion of the gastro-intestinal tract, which normally is fixed. If you can get the mass between your thumb and fingers, and hold it until the infant has an attack of pain, you will feel the tumor definitely harden during the moment of terrific peristaltic action. If the tumor should be in the region of the hepatic flexure, and tucked up under the liver, in all probability you will not be able to palpate it. With the severe tenesmus and straining that these infants present, in the course of a few hours they will usually pass blood and mucus by bowel. The blood is bright red and mixed with the mucus; such a passage is well named "the red-currant jelly stool."

Never omit a rectal examination in these infants. Frequently you will encounter a dilated rectum, which is a rather significant finding. If the head of the intussusceptum has advanced far enough you may feel it in the rectum. It feels like the cervix uteri on a vaginal examination. Occasionally you can palpate the tumor through the rectal wall. If you are unable to feel the mass through the abdominal wall, you should resort to a bimanual examination with the infant held in the upright position; occasionally you will be able to roll the tumor between the examining fingers. If the patient has not passed bloody mucus, sometimes on withdrawal of the rectal finger a gush of blood and mucus and practically no fecal material will follow. This feature is of considerable aid in the diagnosis. Always inspect the rectal finger closely for evidence of blood. If, after these procedures you have failed to demonstrate an abdominal tumor, then I feel you should resort to a barium enema and x-ray examination. I firmly believe that the barium and x-ray should be used as an aid in diagnosis and not as a method of treatment, the reasons for which I shall develop later.

Thus, the diagnosis of acute intussusception in infants is based on: (1) history and characteristic attacks of abdominal pain; (2) palpation of abdominal tumor; (3) blood and mucus passed by rectum.

Fortunately differential diagnosis is not particularly difficult, because there are so few conditions in infants which can simulate acute intussusception.

In acute colitis the pain is not severe and is more constant. The infant has fever, loses weight and it is usually days or weeks before blood appears in the stools. If the infection is very virulent, bleeding may be considerable and shock and even collapse may be in the picture. Intestinal obstruction is not present in this condition, and you cannot demonstrate an abdominal tumor. Be careful not to mistake the spastic colon for the mass of an intussusception.

Henoch's purpura will usually give evidence of bleeding elsewhere, which should be found by a thorough physical and blood examination. I have not had any personal experience with this condition. Recently, however, I had an experience with hemophilia which fortunately proved to be a simple obstruction rather than an intussusception.

Chronic intussusception is very rare in infants. All of the symptoms and findings may be present, but to a much less marked degree. The infants lose appetite and weight and never present shock unless acute obstruction is superimposed upon the chronic partial obstruction. The intussusception is likely to be much more extensive, but the pathological changes in the wall of the bowel are not so marked.

A variety of procedures have been used in the treatment of acute intussusception of infants. Hirschsprung and his contemporaries advocated deep narcosis and reduction by external manipulation. Only those not corrected by this treatment were operated upon, and naturally the surgical results were very poor.

Injection, by rectum, of water or air in conjunction with external manipulation was practiced by the Danish School. But here again many reductions could not be accomplished and operation proved necessary.

Occasionally you will see an infant in the home with the history and findings of an intussusception and during the ride to the hospital it reduces itself. The barium enema will reveal a very irritable colon but no other evidence of the intussusception.

In the past few years I have seen a number of cases in which barium has been used as a therapeutic medium. By that I mean a barium enema has been given under the fluoroscope, and by external manipulation the enterocolic intussusception has been reduced. This procedure is one of clear cut observation and in these cases provided a cure. After observing the first few instances of reduction accomplished in this manner I concluded that six hours was about the limit of time during which this procedure would be successful. Just recently, however, I saw an infant who had an intussusception unquestionably for sixteen hours which was satisfactorily reduced by a barium enema.

After such a manipulation the abdominal pain disappears at once in these infants, color returns to the face, they smile, are perfectly comfortable, and usually drop off into a peaceful sleep.

Now we are all well aware of the fact that this procedure has been condemned by many men as a dangerous method of treating intussusception, yet I feel that these cases must be reported and consideration given to this type of treatment. Some observers believe that if blood appears in the stool a laparotomy must always be done.

It is likewise appreciated by all pediatrists and surgeons that if the appendix has been caught in an enterocolic intussusception damage may occur to the meso-appendix resulting in an occlusion of the blood vessels. This will produce necrosis and perforation of the appendix resulting in peritonitis and death of the infant. This pathological process we are never able to estimate without direct vision and consequently run a grave risk with treatment other than operation.

All of these infants have been kept in the hospital for twenty-four hours' observation and if there is any return of symptoms they are operated upon at once.

This method of reduction should always be done with the aid of one who has had experience with the x-ray, preferably one who has had considerable experience with intussusception in infants.

I have made these comments on this particular type of treatment for purposes of discussion, hoping that the dangers of this procedure are well appreciated, and that it will not be attempted indiscriminately.

With your permission I should like to briefly report two cases which illustrate the dangers of using barium as a therapeutic agent.

An infant with a presumably enterocolic intussusception was given a barium enema with apparent reduction. Because of return of symptoms operation was resorted to fourteen hours later. Laparotomy revealed not an enterocolic intussusception but an enteric type which started back fourteen inches on the terminal ileum and had never been reduced. This gut had received about as much insult as possible and still be viable.

Recently I saw a twenty-month-old baby boy who cried out with an attack of abdominal pain about 4 p.m. He had a few minor attacks between 4 and 6 p.m. but ate his evening meal, fell asleep and slept fairly well until 10 p.m. He then awakened with abdominal pain and vomited several times. The family pediatrist was then called but physical examination was negative except for a slight elevation of temperature. The child was uncomfortable but no abdominal mass could be found nor was there blood in the rectum. Rectal examination did present marked dilatation of the rectum, which was significant. By the process of elimination the tentative diagnosis was intussusception, but because of the paucity of physical findings a barium enema was resorted to. With a flate plate of the abdomen the roentgenologist made a diagnosis of intussusception with the head being at the hepatic flexure. This was confirmed with a barium enema. Pressure on the barium column reduced the intussusception to within a couple of inches of the ileocecal valve. Using as much pressure as we dared, complete reduction was impossible and consequently no barium ever entered the terminal ileum. Laparotomy revealed exactly what was visualized under the fluoroscope. The intussusception was enterocolic in type with the appendix looped around the terminal ileum and included in the intussusception. Gangrene was present in the terminal one-half of the appendix. Naturally, the appendix was removed to prevent necrosis, perforation and peritonitis.

These cases, I think, adequately illustrate the teaching of Ladd, Perrin, and Lindsay, who with their great experience maintain that barium should never be used as a therapeutic measure, and that the moment the diagnosis is made, laparotomy and reduction should be performed.

If the history is typical, and it is too early in the course of the disease for blood to be passed by rectum, or an abdominal mass cannot be palpated, then I believe that we are justified in using a barium enema for diagnostic purposes. If an anesthetic must be given in order to palpate the mass, and it is found, you should be prepared to go ahead with an immediate operation.

The safest anesthesia, from an all-round viewpoint, is ether given by open drop method.

Remember when you are operating upon these infants that they are usually in some degree of shock when they come to the operating table. Every effort must be made to conserve body heat and minimize operative trauma. Wrap the extremities and chest in cotton batting and place the baby on properly covered hot water bottles or electric pads. Keep the temperature of the operating room well above 80 degrees and never permit draughts in the room.

If a mid-right rectus incision is used, two-thirds of which lies above the umbilicus, in the majority of cases you will have the proper exposure.

When the peritoneal cavity is opened, guard carefully against intestinal outpouring. With one hand in the abdominal cavity locate as quickly as possible the intussusception, then gently bring the mass into the wound and under vision. I prefer to do all of the reduction under vision, so that if a tear takes place in the wall of the gut, it is seen and can be repaired at once.

The reduction must always be done by a gentle milking process and never by pulling. Sometimes, because of the marked constriction at the neck, the reduction may be difficult at the start. No pulling or tugging should be permitted for fear of tearing the bowel and producing a peritonitis. Once the reduction has actually commenced you will be surprised how easily the intussusception will unfold by merely milking in front of the head of the intussusceptum. The terminal three or four inches may prove difficult of reduction. Here particular patience and gentleness must be exercised. If the edema of the intussusceptum is marked, take a warm laparotomy sponge, encircle the entire intussusception and gently squeeze fluid out of the tissues. This procedure usually makes complete reduction possible. After reduction you must be able to identify the ileocecal valve, if you have been dealing with an enterocolic type of intussusception. It is much more simple to identify complete reduction in the enteric and colic types. No further procedure is necessary to prevent recurrence, as this practically never happens.

Dr. A. W. Abbott taught us years ago that after reduction of an intussusception we must never remove the appendix unless it is definitely inflamed or gangrenous. There are several reasons for this. In the first place because of the compromised condition of the circulation and the bowel wall the media is perfect for bacterial growth, peritonitis and death. Likewise the infant with intussusception has about all the load he can carry, and if you unnecessarily add to the operative procedure your little one goes into such profound shock that all measures to resuscitate him fail.

For the same reasons you must never remove a diverticulum or polyp at the original operation.

No matter what the appearance of the bowel may be never resect or do an enterostomy. It means death in practically 100 per cent of the cases. Frequently a questionable bowel, when returned to its normal environment, will survive.

If the intussusception is irreducible or, in your opinion, the bowel is not viable, presenting mesenteric thrombosis, then, according to the researches of Montgomery, the safest procedure is to do a lateral anastomosis of ileum to ascending colon, leaving the involved gut in situ. After completing the anastomosis place silk sutures about the neck of the intussuscipiens, holding the irreducible intussusceptum within the lumen of the bowel.

My experience with irreducible intussusception and gangrenous bowel has been so unfavorable that I have felt for some years that perhaps we should attempt some form of conservative management. Occasionally the four, five, or six-day-old intussusception is still reducible, and results in a cure. In view of this fact I believe that every late intussusception warrants a laparotomy and an inspection of the mass, if, in the judgment of the pediatrist and surgeon, the infant will tolerate such interference. Now, if the intussusception is irreducible or the bowel is definitely gangrenous may I be so bold as to advocate conservative management. This entails placing silk sutures at the neck of the intussusception, holding the intussusceptum at this point within the intussuscipiens and getting out of the abdominal cavity quickly. Nasoduodenal suction is started at once to completely deflate the gastro-intestinal tract. Hypodermoclysis of normal saline or Hartman's solution is given several times daily in conjunction with a daily transfusion and intravenous feeding to maintain chemical and fluid levels.

The object of this procedure is to permit the infant to perform his own anastomosis and resection. Such self-cured cases have been reported in the literature and I think we should encourage such procedures in these desperate cases in the hope that we may save a few of these lives.

A patient was observed and treated in this manner recently at the Minneapolis General Hospital. Unfortunately the method was not afforded a fair trial because pneumonia was present on admission from which he succumbed on the ninth day. On the fourth day of his hospital stay the intussusception was recognized and conservative treatment was decided upon. His distention was entirely relieved by nasoduodenal suction, and he was given daily transfusions and intravenous feedings. On the seventh day he began to slough tissue by rectum, in other words, he was performing his own resection. Now the interesting findings about this case were revealed at the postmortem table. The peritoneal cavity appeared perfectly normal. There was absolutely no evidence of peritonitis, there was not one inch of distended bowel, and there had not been any perforation or leakage. The anastomosis had already been performed, and was quite firm. The resection of the intussusceptum had begun and I believe would have been successfully completed if the pneumonia had not been present.

In August of 1940 we had a five-months-old infant boy in the University Hospital who had an intussusception in July. He performed his own anastomosis and resection in a hospital upstate and was sent down to us to combat the dehydration and handle the feeding problem. One month later he is having normal bowel movements but still presents a mild intestinal obstruction. His general health is good and we anticipate complete recovery. Details of this case will be reported later.

This case with the self-resected portion of bowel, which we have, illustrates exactly what I have advocated above.

I cite these cases to recall to your attention what can happen, and also that we must always consider conservative management whenever we are faced with an irreducible intussusception or one that presents gangrenous bowel.

Speed, gentleness in handling tissues, and careful hemostasis is extremely essential when operating upon an infant with intussusception. Be ever cognizant of the grave shock induced by the disease and the operation.

Careful closure of the abdominal wall, layer by layer, is quite necessary. Plenty of stay sutures should be used in anticipation of a possible postoperative eviscer-

ation. Occasionally in the postoperative convalescence of intussusception poor healing of the wound takes place. Several times I have had the experience illustrated by the following case.

On the seventh day following operation on Allen R. for an intussusception, the stay sutures were removed and it appeared as though the wound was healing by primary intention. However, on the twelfth day, when the final stitches were about to be removed the infant cried, the wound gaped about one-half inch in the center, and a small portion of bowel presented in the wound. I thought the entire wound was going to break open and an evisceration take place. However, the wound was strapped tightly with sterile adhesive tape. Recalling the work of Lanman and Ingalls with vitamin C in wound healing, it was thought advisable to use ascorbic acid in this case. From the evidence which has accumulated it is concluded that vitamin C has an important rôle in wound healing. Consequently ascorbic acid was started on this infant, the first dose being given intravenously. It was given twice daily by mouth thereafter and in eight days the wound was entirely healed. At the end of fourteen days after vitamin C was started the wound did not even bulge upon crying, which certainly proved rapid and firm healing. After this experience, and in view of previous catastrophies I feel that ascorbic acid should be used routinely in our postoperative care of intussusception cases.

Always bandage the abdomen tightly and use a protective dressing to prevent wound contamination. After the patient is returned to bed, strap him to the bed, give hypodermoclysis and the usual treatment for shock. If there has been much blood loss a transfusion may be indicated.

As soon as the infant is conscious and able to swallow, fluids should be resumed by mouth. Normal feedings can be started after twelve hours. For the first forty-eight hours the temperature is usually high, due probably to the toxins absorbed from the edematous and damaged bowel wall; otherwise, the convalescence is smooth. I believe these infants should be kept flat on their back for fourteen days to assure proper healing and avoid a possible postoperative hernia.

The prognosis is good if acute intussusception is recognized and operation performed within twenty-four hours of the onset. Between twenty-four and thirty-six hours the outlook becomes only fair, after thirty-six hours poor, and beyond forty-eight almost hopeless. Hence, you will see that the prognosis, in this abdominal catastrophe of infants, is in direct relation to the time elapsing between onset and operation.

My plea is for an early diagnosis of acute intussusception and the institution of immediate surgical intervention in order to save the lives of these infants.

Summary

1. Acute intussusception is the major catastrophe which can take place within the abdomen of the infant.

2. About 85 per cent of all intussusceptions occur in the first two years of life.

3. Types of acute intussusception are: (1) enterocolic; (2) enteric; (3) colic.

4. Diagnosis rests upon: (1) typical attacks of abdominal pain; (2) palpable abdominal tumor; (3) blood and mucus by bowel.

5. Routine administration of ascorbic acid during convalescence is suggested.

6. Conservative management of the irreducible or gangrenous case of intussusception is advocated.

7. Reduction should be accomplished by surgical intervention.

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Discussion

Dr. F. C. Rodda, Minneapolis: I am pleased to have the opportunity to discuss Dr. Wyatt's paper because intussusception was the subject of my own thesis for admission to this society. Further, I want to compliment Dr. Wyatt for the contributions he is making to surgery of the infant. I wish also to pay tribute to Dr. Amos W. Abbott who made such careful bedside observations on intussusception. His paper, given before the Western Surgical Society, was published in the *Journal-Lancet* in 1916. This paper is a classic on the symptomatology and diagnosis of intussusception.

I have a unique report of three cases of intussusception, involving two children in the same family, within a period of one year which illustrate most of the points emphasized by Dr. Wyatt.

Case 1.—S. W., a female, one year of age, an only child, was seen in consultation August 10, 1939. The history was of sudden pain, the child screamed out, became pale, perspired freely. Presently a normal stool was passed. Then followed recurrent attacks of pain in which the child assumed the knee-chest posture. Some hours later bloodly mucus was passed. She was treated for colitis. When seen four days after the onset she was in collapse—the abdomen was so distended palpation was not feasible. A diagnosis of intussusception was made. Operation revealed a gangrenous mass of double intussusception involving about two feet of the bowel. Death followed promptly.

In this case, although there was a typical history, the attending physician had not thought of intussusception, and the patient was operated upon too late.

Case 2.—July 9, 1940, eleven months after the above incident the same father phoned me stating he had another baby which surely had intussusception.

R. W., seven months of age, suddenly cried out with pain, became pale, perspired (shock), vomited once, then had recurrent attacks of pain lasting one to two minutes, repeated every ten to fifteen minutes, during which he assumed the knee-chest posture and strained as at stool. A sausage shaped mass was felt midway between the hepatic and splenic flexures of the colon. Rectal examination revealed clotted blood. A barium enema given about three hours after onset was tem-

porarily arrested at the site of the tumor, then proceeded to the ileocecal valve. The mass disappeared, pain ceased, the child relaxed and after two days' observation in hospital the child was discharged. He was eating well, having normal stools.

In this case the symptoms were so clear that the father was able to recognize the condition. Efficient reduction was accomplished with a barium enema.

Case 3.—On August 28, 1940, about seven weeks after the above incident, the same father phoned that the same child was again the victim of intussusception.

R. W., now about nine months of age, experienced a sudden onset of pain followed by shock, vomited, then had a recurrent attack of pain, and assumed the knee-chest posture. A sausage shaped tumor was palpable in the region of the mid-transverse colon. Rectal examination was negative. Again, about two hours after the onset, a barium enema was given which was arrested at the site of the tumor and did not proceed beyond that point. Specks of blood appeared in the barium solution when it was passed. Within an hour Dr. Wyatt operated on the child, found the mass, reduced it readily, left the appendix alone. He made a prompt recovery and has remained well since.

In this case the father was again able to make the diagnosis. Attacks of intussusception are truly typical. The barium enema confirmed the diagnosis but did not avail in reducing the intussusception. Early resort to surgery, easy reduction with speedy recovery, no recurrence, perhaps because of adhesions, following the operation.

The Danish physicians, Koch and Oerum, report on 400 cases of intussusception treated by their "Bloodless Method" which consisted of chloroform anesthesia, taxis and an enema of 500 to 1000 c.c. of water. Their mortality rate was 35 per cent. Their surgical treatment gave a mortality rate of 75 per cent but this was unfair to surgery since it was not called upon until after the manipulations of their bloodless method.

We have reduced a goodly number of intussusceptions with a simple barium enema given gently, that is, with little pressure. We have chosen cases involving the colon, of short duration and not attended with severe shock. Also we have held the patients under close observation for several days because the factors of the status of the appendix, multiple sites, circulation of bowel cannot be determined.

In the irreducible cases with gangrenous gut I am much indebted for Dr. Wyatt's suggestions. Not a single patient of ours in whom resection of the bowel has been done has recovered. With our newer methods of supplying fluids, food and vitamins parenterally and the use of Wangensteen's technique of nasal suction we surely should have better prospects without surgery than our attained mortality of 100 per cent with resection.

Dr. E. J. Huenekens, Minneapolis: It is difficult to add anything of importance to this excellent presentation of Dr. Wyatt's and the able discussion by Dr. Rodda. From a pediatric standpoint, I am interested primarily in the diagnosis of intussusception. Coming out of a clear sky, the sudden onset of pain is so characteristic that I have been able to make a diagnosis over the telephone from the description given by the mother. In the earlier stages some of these cases are considered to be dysentery because of the bloody mucus evacuated from the bowels. An important difference is that in intussusception, after the lower bowel has been emptied of its contents, from then on there is absolutely no fecal matter in the bowel discharges, nothing but blood and mucus. If, after careful consideration, it is difficult to determine with certainty whether or not intussusception is present, it is better to make an exploratory incision than to wait even a short time to confirm the diagnosis. Even a few hours may be too late to save the patient.

Dr. Arnold Schwyzer, Saint Paul: I remember that sometimes we have held these children up by the ankles, let the head drop down, and given the child an ordinary plain water enema by gravitation. Barium enemata are all right where one has help in the hospitals, but years ago I have seen results from the other method with a water enema. This can be carried out in the country practice.

When a case comes to surgery, there is one very important thing we should not forget. These children have feculent vomiting and, before operating, one should be sure to clean the stomach out; that is very important and should be emphasized.

By the way, the lower right quadrant is usually the most empty spot in the abdomen and down there you don't feel anything.

I have seen intussusception recur. When you have a recurrent intussusception, what are you going to do?

In those cases it is advisable to sew the lowest ileum loop to the ascending colon, to get a double-barrel effect. If one chooses, a catgut may fix the cecum in the iliac fossa. In one case of ours there was much edema and we tore the gut a little, but the child got well anyway.

The meeting adjourned.

E. V. Kenefick, M.D.,
Secretary

Phenytoin Sodium (Sodium Diphenyl Hydantoinate)

The Council on Pharmacy and Chemistry has adopted the designation "Phenytoin Sodium" (accented "phén-y-tŏin sodium") as a nonproprietary name for sodium diphenyl hydantoinate. Acceptance is continued of Dilantin Sodium, the proprietary name under which Parke, Davis & Co. markets its brand of this product. (*Jour. A.M.A.,* May 3, 1941, p. 2019.)

Sulfadiazine and Sulfaguanidine

The Council on Pharmacy and Chemistry has adopted the term sulfadiazine for 2-sulfanilamido-pyrimidine and the term sulfaguanidine for sulfanilylguanidine. The latter term was adopted after consultation with Dr. E. K. Marshall, Jr., who kindly expressed his assent to the Council's recognition of the term. (*Jour. A.M.A.,* May 3, 1941, p. 2019.)

TRANSACTIONS of the MINNEAPOLIS SURGICAL SOCIETY

Stated Meeting, Thursday, March 6, 1941

President, James A. Johnson, M.D., in the Chair
Secretary, R. F. McGandy, M.D.

ACUTE SPINAL EPIDURAL ABSCESS*
Report of Case

Harold F. Buchstein, M.D.
Minneapolis

Dandy (1926) was the first to direct attention to the fact that acute pyogenic infections within the spinal epidural space produce a characteristic clinical syndrome which permits their distinction pre-operatively from other intraspinal lesions. Such recognition is of more than academic interest since these lesions constitute a real surgical emergency.

Pyogenic infections of the spinal epidural space may result from the direct extension of an adjacent lesion, such as a carbuncle or perinephritic abscess. More commonly, however, they arise by hematogenous metastasis from a distant focus of infection. Cutaneous lesions, such as furuncles, paronychiæ and infected blisters are the most frequent sources of the infection. Less commonly, infections of the paranasal sinuses, the respiratory passages or the teeth may be responsible. Many such metastatic epidural infections follow minor trauma to the region of the spine, which is then presumed to have created there a focus of lowered resistance in which a septic embolus lodges. The infecting organism is most often the staphylococcus.

Metastatic spinal epidural infections appear to occur more frequently than the brief comment they receive in most surgical texts would suggest. During the course of a year I have had occasion to operate upon two patients with such infections, one of whom is here reported.

A young married woman of nineteen years was in the fifth month of her first pregnancy when she was found to have a cystic ovarian tumor. Removal was advised, for which purpose she was admitted to the Gynecological Service of the Minneapolis General Hospital.

The patient had considered her general health to be good and she had had no previous operations. Physical examination, aside from the pelvic examination, disclosed nothing of note. Routine laboratory studies of the urine and blood gave findings within the limits of normal aside from a mild anemia, the hemoglobin content of the blood being 65 per cent of normal. A complement fixation test for syphilis was negative and no Neisserian organisms were found in a cervical smear.

Laparotomy was performed on June 5, 1940, under spinal anesthesia. Difficulty was encountered in entering the vertebral canal, repeated withdrawals and reinsertions of the needle being made, all in the same interspace. Eventually the dura was pierced and the drug (metycaine, 125 mgm.) was injected. Satsfactory anesthesia was produced and the operation was completed without further untoward incident, a large ovarian cyst being removed.

The patient's wound healed promptly and she was afebrile and comfortable upon being discharged from the hospital on the tenth postoperative day. Three days later she developed low back pain which became progressively more intense and which presently radiated in girdle fashion about her lower abdomen, just above the inguinal ligaments. Straining and bearing down intensified the pain. Subjective numbness was noted in the left foot.

Upon readmission to the hospital on June 20, 1940, the patient appeared acutely ill. Her temperature was 101° F. and varied between 99° and 103° on succeeding days. Her abdominal wound was found to be well healed and no evidence of inflammation was found on pelvic examination. Exquisite tenderness was noted over the lower lumbar spine and the patient complained bitterly of low back pain. Daily urinalyses showed only a trace of albumin and a few pus cells per high power field. The blood contained 61 per cent hemoglobin and the erythrocytes numbered 3,300,000 per cubic millimeter. The blood leukocyte count was 25,350 per cubic mm., 94 per cent being polymorphonuclear forms. The blood sedimentation rate was 144 mm. in one hour. Cultures from the throat and from the uterine cervix gave no growth. X-rays disclosed no abnormality in the lumbar spine or pelvis.

Under observation in the hospital the patient became progressively worse. The subjective numbness spread upward over both lower extremities, and both lower extremities became weak. On the second hospital day the patient was unable to void and catheterization was thereafter necessary. Presently the skin over the lower lumbar spine became reddened and elevated, and the patient cried out with pain upon any movement of her lumbar spine. On June 25, because of the development of headache and a stiff neck, spinal puncture was attempted. However, when a needle was inserted in the site of the previous puncture pus was obtained before the needle had penetrated the dura.

A diagnosis of acute spinal epidural abscess having been made, the patient was transferred to the surgical service and preparation was made for immediate laminectomy. Before operation the patient was given four grams of sodium sulfapyridine intravenously. Under ether anesthesia a midline incision was made over the spines of the third and fourth lumbar vertebræ. The subcutaneous tissues were found to be diffusely edematous, and when the lumbar fascia was incised and separated from the tips of the transverse processes a considerable quantity of greenish purulent fluid escaped spontaneously on both sides. The muscles were readily separated from the spinous processes and laminæ, and it was seen that they were diffusely inflamed and in part necrotic. The spines and laminæ of the third and fourth lumbar vertebræ were first resected. The bone was normal in consistency and did not present any areas of frank osteomyelitis. The dura thus exposed was covered with a soft granulomatous mass containing much free pus. Because the lesion extended in both directions beyond the limits of the exposure, the incision was enlarged and an additional lamina removed both above and below. With this exposure the limits of the granuloma were reached and dura of normal appearance was seen at both ends. Gentle retraction of the dura from side to side permitted the evacuation of a considerable quantity of pus from the anterior portion of the epidural space, and

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from the canal beyond the limits of the laminectomy. The softer areas of the granulomatous mass were removed by suction and gentle blunt dissection. The dura was not opened. The wound was left wide open for drainage and a gauze pack was placed over the granuloma for the control of bleeding.

Postoperatively the patient was placed on sodium methylthiazol orally, in sufficient dosage to maintain a blood level of 11 to 14 mgm. per cent, and this was continued until her temperature reached a normal level, which it did at the end of seven days. During this week she was given daily blood transfusions, a total of 4,825 c.c. of blood being given. On the advice of the Obstetrical Service, 100 per cent oxygen was administered via a B.L.B. mask at frequent intervals during the day for several weeks. Under this regimen the patient made steady improvement. By the third day, all evidence of stiff neck had disappeared and the patient had regained the power of voluntary motion in her toes. Catheterization was necessary for eighteen days.

The day following operation the pack was removed from the wound and was replaced by vaseline gauze strips to prevent adhesion of the wound margins. Sulfanilamide powder was instilled daily. There was profuse purulent and sanguinous discharge for several days, after which the amount of drainage progressively decreased. On the ninth postoperative day, under intravenous pentathal anesthesia, the stay sutures which had been inserted through the skin and muscles at the time of operation was tied, bringing the muscles into approximation except at the ends of the incision. A long Penrose drain was placed between the muscles and the dura and brought out at both ends of the wound. Thereafter the wound was irrigated daily with Dakin's solution. Healing continued and the drain was removed in a week's time.

On the eleventh postoperative day the patient complained of pain in the right side of her face, had a chill, and her temperature rose to 101.5°. The following day there was a spontaneous discharge of pus into the right maxillary sinus and the mouth. This was found to be coming from a large dental root abscess beneath a necrotic third upper molar. The tooth was extracted and the patient's temperature promptly returned to normal. This dental abscess is regarded as the probable source of the metastatic epidural infection, since it is the only other infectious focus found in the patient's body. Cultures from the root abscess yielded a mixed culture of staphylococci, streptococci and pneumococci. Cultures of the epidural abscess grew out Staphylococcus aureus.

The patient was allowed to sit in a chair at the end of twenty-five days, and was walking about in comfort upon her discharge from the hospital on the thirty-fifth postoperative day. Her wound was healed.

The patient was readmitted to the Minneapolis General Hospital on the Obstetrical Service on October 25, 1940, just four months from the day of operation, and was delivered of a normal full term female infant without incident. At this time her wound was firmly healed and she had no symptoms or complaints referable to her back or lower extremities.

The diagnosis of metastatic acute spinal epidural abscess is readily made if one bears the possibility in mind. The symptoms come on some days or even weeks after the initiating trauma. The onset is with severe local pain in the spine, which presently is augmented by pain in the distribution of those nerve roots which are irritated as they pass through the epidural space in the region of the inflammatory process. These root pains characteristically are aggravated by coughing, jarring and straining. Within a matter of days signs of spinal cord involvement appear in the form of sensory and motor paralyses and loss of sphincter control. If unchecked these proceed relatively rapidly to a state of complete paralysis, so-called acute transverse myelitis. The patient is acutely ill and has an elevated temperature and leukocyte count. Examination reveals, in addition to the neurologic signs resulting from the spinal cord involvement, exquisite tenderness of the spine in the region of the abscess together with rigid splinting of the back. The skin overlying the intraspinal abscess may be reddened or edematous. Search may reveal an unsuspected focus of infection elsewhere in the body, particularly in the cutaneous tissues. The diagnosis may be confirmed by aspirating purulent material through a needle inserted into the region of the local swelling or into the epidural space (but not through the dura!) in the region involved. Spinal puncture performed below the level of the lesion will disclose a block of the spinal subarachnoid space and the fluid will contain an increased number of cells but no microorganisms. X-rays of the spine do not contribute to the diagnosis except as they exclude other lesions, such as malignant tumors of the bone.

This appears to be the first recorded instance of spinal epidural abscess arising as a complication of spinal puncture. It seems reasonable to assume that as a result of the repeated insertions of the spinal puncture needle a hematoma formed in the epidural space at the site of puncture, or sufficient injury was done to the interspinal ligaments to provide a necrotic area in which, subsequently, a septic embolus from the dental route abscess lodged. The long interval between the spinal puncture and the onset of symptoms, and the absence of leptomeningitis make it unlikely that the infecting organisms were introduced by the spinal puncture needle.

The only other report of a spinal epidural abscess which followed spinal anesthesia is that of Van Den Berg, but it is by no means clear that the two events were in any fashion related in his case, nor did he claim that they were. A fifteen year old girl sustained a fracture about the ankle as the result of an automobile accident. Because she had an acute upper respiratory infection a spinal anesthesia was administered to permit reduction of the fracture. On the fifth postoperative day the patient complained of girdle pain about her lower chest and on the eighth day she rapidly became completely paralysed below that level and died within the next day, no diagnosis having been made. At postmortem examination the entire spinal epidural space, from the foramen magnum to the sacrum, was filled with pus containing staphylococci. It is not apparent from the description of the autopsy findings at what point the abscess arose, but to judge from the clinical history it began first in the thoracic region and not in the lumbar region where the spinal puncture was performed. The trauma of the accident itself may reasonably be assumed to have been the precipitating factor.

The need for surgical drainage of a spinal epidural abscess at the earliest possible moment scarcely requires comment. Laminectomy is done at the point of maxi-

mum local tenderness. This is a more reliable guide to the site of the lesion than is the sensory level found on neurologic examination. It should not be necessary to resort to myelography to localize these lesions. The laminectomy should be wide enough to provide free drainage, and should be left wide open.

Without surgical drainage, acute spinal epidural abscesses are almost invariably fatal, and even with such drainage the mortality has in the past been high. Thirty-five per cent of 88 operated cases collected from the literature by Campbell (1937) died, and of those who survived, only 40 per cent escaped without some permanent disability. The survival with good functional recovery which followed in the two cases which I have operated upon may be attributed to three factors: (1) prompt and adequate laminectomy when the diagnosis was made; (2) the free use of postoperative transfusions as a supportive measure; and (3) intensive chemotherapy before and after operation.

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2. Campbell, M. M.: Pyogenic infections within the vertebral canal. Bull. Neurol. Inst. N. Y., 6:574-591, (Dec.) 1937.
3. Dandy, W. E.: Abscesses and inflammatory tumors in the spinal epidural space (so-called pachymeningitis externa). Arch. Surg., 13:477-494, (Oct.) 1926.
4. Gasul, B. J., and Jaffe, R. H.: Acute epidural abscess, a clinical entity. Report of three cases in children with a complete review of the literature. Arch. Pediat., 52:361-390, (June) 1935.
5. Van den Berg, W. J.: Acute metastatic spinal epidural abscess. Calif. and Western Med., 46:257-259, (April) 1937.

DIVERTICULA OF THE GASTRO-INTESTINAL TRACT

JAMES JOHNSON, M.D.

Dr. James Johnson gave a very interesting paper entitled "Diverticula of the Gastro-intestinal Tract."

Following is the brief discussion.

Discussion

DR. LEE: Is there any relationship between diverticulitis and trauma or any exertion such as shoveling snow?

DR. JOHNSON: I have gone over this subject very thoroughly and find no reference in the literature to trauma having any etiological significance. The cause of the diverticula of course is intraluminal pressure. I do not see how a diverticulitis could in itself be due to trauma except perhaps from some severe trauma direct to the abdomen. In that case, of course, the diverticulum would have to be present before the trauma. I believe it would be fair to state that there is no connection between trauma and diverticulitis.

Dr. F. A. Olson showed some very interesting slides of the technique employed in the treatment of diverticulæ. He also gave a brief discussion of the technique.

DR. STANLEY R. MAXEINER: Dr. Olson's discussion and his very excellent photographic slides were thoroughly enjoyable. Part of the slides which he showed were photographic illustrations of the paper which I recently presented before the Western Surgical Association.

For years there has been a controversy as to whether one should employ the one- or two-stage procedure. Dr. Lahey has adhered to the two-stage operation because he believes that it is safer, while Babcock, Shallow and others subscribe routinely to the one-stage operation.

The technique which we have recommended and which, to our knowledge, is original, possesses all of the merits of the two-stage operation but may be accomplished in one stage. We do not see many of these patients but one such operation has been performed with complete success. Dr. Carl Rice operated upon one patient by this technique and Professor Wangensteen of the University employed the same procedure on another patient with equal success. In each of these three cases the clamp fell off in about six days, there was no sinus and the patients gained weight rapidly.

A patient operated upon by us several years ago by the Coffey technique for an annular constriction of the rectosigmoid which had every gross appearance of malignancy proved to be an inflammatory reaction around a diverticulum. A second similar case had a perforation of a diverticulum in which we found a campaign button. A portion of the wall of the diverticulum was removed for biopsy, the perforation was closed and the wound drained. Biopsy revealed a malignancy superimposed on a perforating diverticulum from which we had removed the campaign button, the celluloid cover of which had entirely disintegrated.

CONSTITUTION AND DIET IN TUBERCULOSIS

Resistance to disease may depend upon many things, but probably the most important, all other things being equal, is the inherited constitution. This belief is based on epidemiological studies, family records, studies of identical and fraternal twins, and animal experimentation. Excellent examples of each are cited and interpreted by the author.

The constitution can, however, be modified by outside influences, not the least of which is the food we eat. That diet does influence the cause of tuberculosis has been well demonstrated by students of the problem during economic depressions and war.

For example, Denmark's experience during the World War is significant. In the belligerent countries the tuberculosis death rate rose steadily and reached its peak in 1918. In Denmark also the rate rose but the peak was reached in 1917 and fell precipitately. From the beginning of the war Denmark exported great quantities of butter, cattle and bacon; margarine replaced butter in the diet. There was loss of vitamins A and D. The consumption of meat and fish fell off. In 1917 the blockade interfered with exportation. The consumption of butter in Denmark promptly quadrupled, and that of meat increased almost five-fold. Total calories consumed did not vary much. All other factors that might influence the tuberculosis rate were accounted for. The consumption of meat and fish seemed to parallel the mortality curve inversely—the consumption of vegetables did not.

Better dietary habits, especially during the past twenty years, have enhanced inborn resistance to all diseases including tuberculosis. These two factors, the inherited constitution and the better understanding of nutrition, have played their part in the reduction of the tuberculosis mortality rate.—*Constitution and Diet in Tuberculosis, by Fred H. Heise, M.D., Amer. Rev. of Tuber., Feb., 1941.*

AMERICAN COLLEGE OF PHYSICIANS

One of the large medical meetings held each year is the annual session of the American College of Physicians. Next year's meeting will be in Saint Paul, April 20-24, according to the announcement of Dr. Roger I. Lee, of Boston, president of the college, who is in charge of the program of the General Sessions and Lectures. Dr. John Lepak, Saint Paul, has been appointed general chairman and will have charge of the hospital clinics and all local arrangements. Mr. Edward Loveland, executive secretary of the College, 4200 Pine Street, Philadelphia, will have general management of the session and the technical exhibits.

AMERICAN CONGRESS OF PHYSICAL THERAPY

The twentieth annual meeting of the American Congress of Physical Therapy will be held September 1 to 5, 1941, inclusive, at the Mayflower Hotel, Washington, D. C.

The mornings will be devoted to an instruction course and the afternoons and evenings to scientific and clinical sessions. Sessions will be open to physicians and qualified technicians.

Further information may be obtained by addressing the American Congress of Physical Therapy, 30 North Washington Avenue, Chicago, Illinois.

At the same time the twenty-fifth annual meeting of the American Occupational Therapy Association will be held at The Mayflower. For further information address Mrs. Meta R. Cobb, 135 Fifth Avenue, New York, N. Y.

INTER STATE POSTGRADUATE MEDICAL ASSOCIATION

The International Assembly of the Inter State Post Graduate Medical Association will be held in the auditorium at Minneapolis the week of October 13, 1941. The Hennepin County Medical Society will be host to the Assembly and some eighty-five prominent teachers and clinicians from the United States and Canada will appear on the program.

A large number of Minnesota men will take part in the International Assembly. Those who will give clinics include: Dr. Claude F. Dixon of Rochester, "Regional Ileitis"; Dr. N. Logan Leven of Saint Paul, "Burns and Reconstructive Surgery"; Dr. C. Donald Creevy of Minneapolis, "Stones in the Upper Urinary Tract"; Dr. Walter Alvarez of Rochester, "Nervous Exhaustion as a Cause of Gastro-Intestinal Symptoms"; Dr. John L. McKinley of Minneapolis, "Neuritides"; Dr. Paul A. O'Leary of Rochester, "Modern Treatment of Syphilis"; and Dr. Irvine McQuarrie of Minneapolis, "The Etiology and Treatment of Nephrosis in Children."

Among those giving addresses will be: Dr. Alfred W. Adson of Rochester, "The Diagnosis and Surgical Management of Brain Tumors"; Dr. E. T. Bell of Minneapolis, "Acute and Chronic Glomerulonephritis"; Dr. William F. Braasch of Rochester, "Hypertension and the Surgical Kidney"; Dr. Howard K. Gray of Rochester, "The Use of Pedicle Muscle Grafts in Obliterating Non-tuberculous Empyema Cavities"; Dr. Robert G. Green of Minneapolis, "Virus Diseases"; Dr. Charles W. Mayo of Rochester, "High Concentrations of Oxygen in Surgery"; Dr. John L. McKelvey of Minneapolis, "Disturbances of the Vascular System in Pregnancy"; Dr. Horace Newhart of Minneapolis, "Possibilities of Attainment in the Conservation of Hearing"; Dr. Maurice B. Visscher of Minneapolis, "Physiological Studies on the Usefulness of Helium in Respiratory Mixtures"; Dr. Waltman Walters of Rochester, "Adrenal Tumors"; and Dr. Owen H. Wangensteen of Minneapolis, "Some of the Advantages of Closed Anastomosis in Gastro-intestinal Resections."

NAVY MEDICAL CORPS

The Surgeon General of the U. S. Navy has announced that the next examinations for entrance into the regular Navy as commissioned officers in the Medical Corps will be held for Acting Assistant Surgeon (Intern) on October 6, 1941, January 5, 1942, and for Assistant Surgeon on August 11, 1941, October 6, 1941, January 5, 1942.

Examinations will be held at all of the larger naval Hospitals and at the Naval Medical Center, Washington, D. C. Applications for authorization to take the examination must be in the Bureau of Medicine and Surgery three weeks prior to the date of the examination. Application forms for these examinations will be forwarded by the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., upon request.

MINNESOTA RADIOLOGICAL SOCIETY

The thirteenth annual meeting of the Minnesota Radiological Society was held in Saint Paul on May 27, 1941. Dr. Leroy Sante of Saint Louis delivered the Annual Carman Lecture before the general session of the Minnesota State Medical Association. His subject was "Roentgen Observations in Chest Injuries."

Dr. G. T. Nordin of Minneapolis was elected president of the Minnesota Radiological Society, Dr. A. U. Desjardins of Rochester was elected vice president and Dr. J. P. Medelman of Saint Paul was reëlected secretary.

(Continued on Page 598)



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COURSES IN OBSTETRICS

The Illinois State Department of Public Health and the United States Children's Bureau are sponsoring ten four-week courses in obstetrics during 1941-42 at the Chicago Lying-in Hospital, University of Chicago. The first course began June 30. Only a limited number of physicians will be accepted for each course. Applications and inquiries should be addressed to Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The program for the meeting of the Minnesota Society of Neurology and Psychiatry held in Rochester, May 24, included a surgical demonstration in the morning, a luncheon at the Mayo Foundation House at which Dr. T. B. Magath of Rochester spoke, and a program of scientific papers presented in the afternoon in the sixth floor auditorium of the new wing of St. Mary's hospital. Sixty persons attended the luncheon.

Those who presented papers included: Drs. O. A. Turner, J. W. Kernohan, L. M. Eaton, M. N. Walsh, W. McK. Craig, G. S. Baker, H. W. Wagener and J. D. Camp. The program was followed by a surgical clinic conducted by Drs. Craig, J. G. Love and Baker.

MINNESOTA-DAKOTA ORTHOPEDIC CLUB

Meeting in Rochester, May 24, thirty members of the Minnesota-Dakota Orthopedic Club attended a dry clinic at St. Mary's hospital in the morning, followed by a general session and luncheon at the Mayo Foundation House at 10 a.m.

BROWN-REDWOOD MEDICAL SOCIETY

Dr. T. R. Fritsche of New Ulm was elected president of the Brown-Redwood Medical Society at its annual meeting in New Ulm, May 14. Other officers elected were Dr. E. J. Wohlrabe of Springfield, vice president; and Dr. O. B. Fesenmaier of New Ulm, secretary-treasurer. Dr. Hjalmar Mortensbak of Hanska is the retiring president.

The meeting and program followed the annual banquet for the physicians and their wives.

Dr. Walter Fansler of Minneapolis read a paper on "Rectal Diseases," and Dr. Myron Henry, also of Minneapolis, a paper on "Fractures of the Upper Arm."

SCOTT-CARVER MEDICAL SOCIETY

When the annual meeting of the Scott-Carver Medical Society was held at the Shakopee State Reformatory, June 10, Dr. George T. Schimelpfenig of Chaska was elected president. Other officers named are: Dr. Edward E. Novak of New Prague, vice president; Dr. B. F. Pearson of Shakopee, secretary. Dr. Novak was named delegate; Dr. Pearson, alternate; and Dr. Frederick Herbert Buck of Shakopee, censor.

Dr. Lad John Kucera of Lonsdale and Dr. Pearson reviewed pediatric and obstetrical short courses.

In Memoriam

Fletcher Weston Powers

Dr. Fletcher Powers, for thirty-nine years a practitioner at Barrett, Grant County, Minnesota, died at his hospital on April 26, 1941, after a lingering illness.

Dr. Powers was born at Delano, Wright County, Minnesota, September 25, 1872. He received his early education in Saint Paul, Minnesota, and received his medical degree at Hamline University in 1902. He was licensed and began practice in the same year at Barrett, Minnesota. He later took postgraduate work in surgery.

In 1915 he opened his own hospital for medical, surgical and obstetrical work, which he operated until his death.

Dr. Powers was active in all civic affairs. He was a member of the Park Region Medical Society, the Minnesota State and American Medical Associations, a member of the Minnesota Hospital Association and also a member of the Masonic lodge.

His death caused great sorrow not only in Barrett, where he had lived and worked for more than thirty-nine years, but also throughout the entire county and many distant points to which his acquaintanceship and friendly disposition had spread.

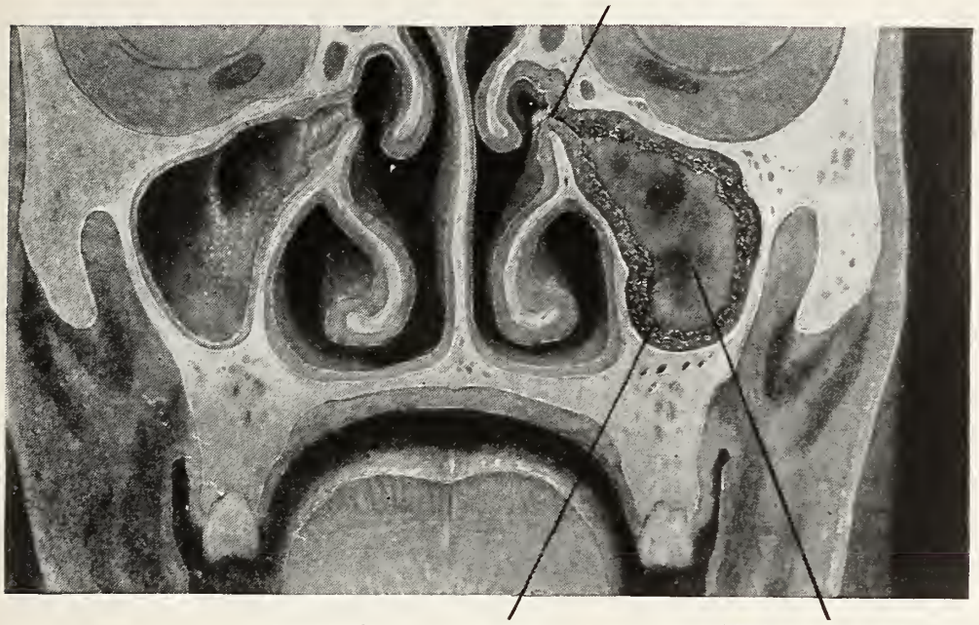
Dr. Powers was one of the best known and best loved men in Grant County. His philosophy of life was a constant urge and desire to "Live in a house by the side of the road and be a friend of man."

His body was taken to Rockford, Minnesota, for burial.

His wife and four daughters survive, also one sister, Mrs. E. E. Barrow of Big Lake, Minnesota, and a foster brother, Harry Atwood of Austin, Minnesota.

Fulminating pulmonary tuberculosis, such as miliary tuberculosis, is rather infrequent among persons in better circumstances, while fibroid phthisis is more likely to occur among persons under better economic surroundings. Extremely acute manifestations of rheumatic infections are relatively infrequent among the better-to-do, while the more chronic type of fibrosing mitral stenosis is more likely to occur. In both tuberculosis and rheumatic fever these differences are conditioned by better treatment, ability to obtain more rest, less arduous occupations and many other considerations.—O. F. Hedley, *Pub. Health Rep.* (Oct. 11) 1940.

PATHOLOGY OF THE UPPER RESPIRATORY TRACT: 2



INFECTION OF THE ANTRUM OF HIGHMORE



SOLUTION



EMULSION



JELLY

CARDINAL principle of treatment of such infections is establishment of free drainage. To do this without surgery the mucous membranes must be shrunk thoroughly—for long periods, yet without local toxic effects.

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OF GENERAL INTEREST

Dr. Leo Conlin has opened offices at 73 Seventh Avenue N. E. in North Saint Paul.

* * *

Dr. F. C. Dolder of Eyota, Minnesota, is president of the Eyota Commercial Club.

* * *

The marriage of Dr. J. F. Pohl of Minneapolis to Miss Alice Elizabeth Croze, took place in Minneapolis, June 16.

* * *

Dr. J. A. Bargen of Rochester is the newly elected secretary of the American Gastro-Enterological Association.

* * *

Dr. Jesse L. Bollman of Rochester is the newly elected president of the American Society for Experimental Pathology.

* * *

Dr. L. A. French of Minneapolis is assisting Dr. H. T. Petraborg of Aitkin. The latter is planning a vacation trip to the West Coast.

* * *

Dr. Frank H. Krusen of Rochester was guest speaker at a meeting of the Alumni Association of the Jefferson Medical College of Philadelphia, June 5.

Dr. T. J. Bloedel of Minneapolis is assisting Dr. R. O. Spittler of New Richland and will take over the latter's practice when Dr. Spittler is called for service in the army as reserve medical officer.

* * *

Dr. John Kelly of Saint Paul has taken over the practice in Aitkin of Dr. R. A. Murray, who has been called to duty with the United States Army as captain in the medical corps at Fort Leonard Wood.

* * *

Dr. E. N. Nelson, who has practiced medicine in Lake Park, Minnesota, for the past four years, is now located in Minneapolis, having become associated with the Bloomington-Lake Clinic last month.

* * *

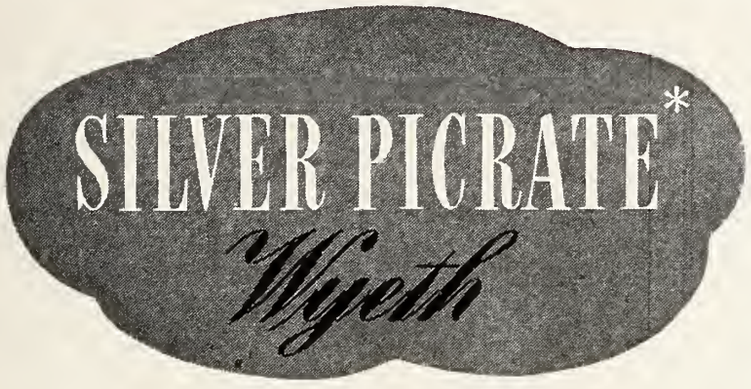
Dr. James E. Dyson, a graduate of the University of Minnesota Medical School Class of 1916, has been appointed acting director of health of the public schools of Des Moines, Iowa.

* * *

Among those addressing the eighteenth annual meeting of the Pacific Northwest Medical Association in Spokane, Washington, June 25-28, was Dr. John deJ. Pemberton of Rochester whose subject was "Surgery of the Thyroid Gland; Lesions of the Colon and Rectum; Present Status of Surgery of the Spleen."



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Silver Picrate, Wyeth, has a convincing record of effectiveness as a local treatment for acute anterior urethritis caused by Neisseria gonorrheae.[1] An aqueous solution (0.5 percent) of silver picrate or water-soluble jelly (0.5 percent) are employed in the treatment.

1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., **23**, 201 (March), 1939.

A complete technique of treatment and literature will be sent upon request

■

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JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA

A gift of rare lithographs showing the anatomy of the ear have been presented to the University of Minnesota division of Otolaryngology by Dr. Charles Nelson Spratt of Minneapolis.

* * *

Dr. E. M. Kingsbury of Clearwater recently was named chief medical officer at the state reformatory at Saint Cloud. He will continue his Clearwater practice, maintaining evening office hours there.

* * *

Dr. John J. Ederer, who had been stationed at Fort Lewis, Washington, in the army medical corps, has returned to Mahnomen to resume his medical practice. He has reopened his hospital there.

* * *

Dr. Howard H. W. Wolfe of Saint Paul has been promoted from the rank of captain to that of major in the army medical corps. Dr. Wolfe is stationed at Camp Haan.

* * *

Dr. Edward C. Rosenow of Rochester presented a report on "Poliomyelitis in the Fort Wayne Area during the 1940 Epidemic" at a meeting of the Fort Wayne Medical Society, Indiana, April 22.

* * *

The University of Minnesota Hospitals has increased its rates to conform with minimum rates adopted by the Saint Paul and Minneapolis hospital councils. Rates for accessory services have been brought into line with the new rates.

Dr. E. E. Barrett of Duluth was recently certified by the American Board of Pediatrics, while Dr. P. N. Bray, also of Duluth, was certified by the American Board of Obstetrics and Gynecology.

* * *

Dr. Kenneth L. Nelson, who has been on the medical staff at the state hospital in Anoka, has taken over the practice of Dr. Fred H. Wiechman of Montgomery during the latter's period of service with the United States Army.

* * *

When the seventy-second annual meeting of the Canadian Medical Association was held in Winnipeg, June 23-27, Dr. William F. Braasch of Rochester presented a paper, "The Surgical Kidney as a Factor with Hypertension."

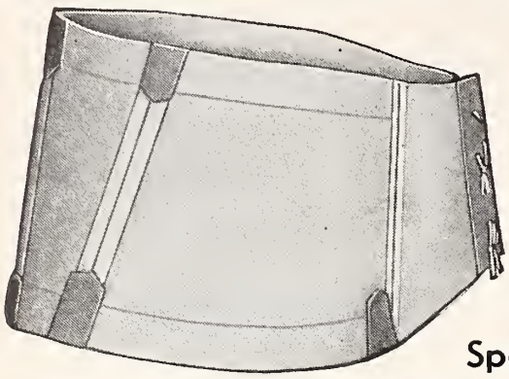
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Dr. E. V. Allen of Rochester is the newly elected president of the Mayo Foundation chapter of Sigma Xi, succeeding Dr. R. M. Wilder. Other officers are Dr. A. C. Broders, vice president; and Dr. H. E. Essex, secretary-treasurer.

* * *

Dr. George E. Runnerstrom of Minneapolis, who for nineteen years has been associated with the United States Veterans Administration at Fort Snelling, has become a medical member of the Dependents' Pension Board in Washington. A graduate of the University of Minnesota School of Medicine, Dr. Runnerstrom has for the past 17 years been a medical member of a claims and rating board.

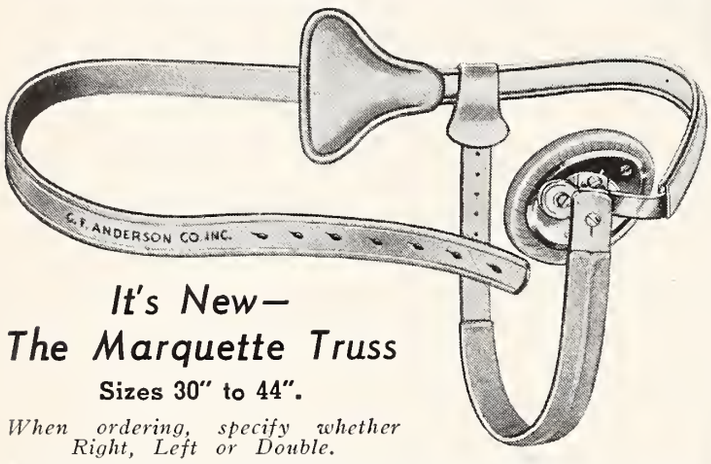
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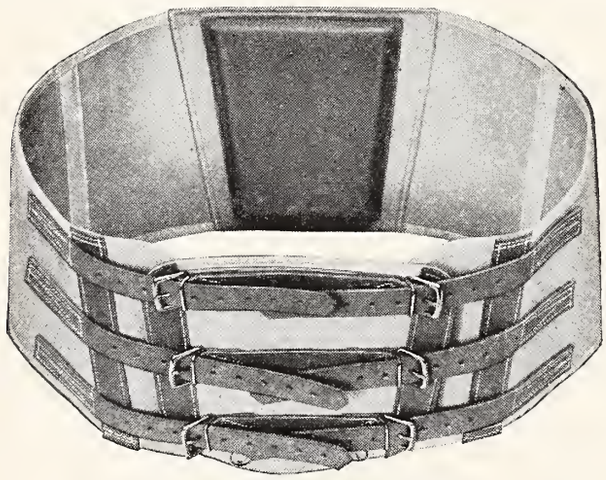
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901 MARQUETTE • MINNEAPOLIS

Dr. Russell M. Wilder of Rochester addressed the annual Conference of Health Officers and Public Health Nurses held at Saratoga Springs, New York, June 24-26. His subject was "Nutrition—A Public Health Problem."

* * *

Clinics were conducted by Drs. Gordon B. New and Waltman Walters of Rochester and Dr. George E. Fahr of Minneapolis at the eighteenth annual assembly and dry diagnostic clinic of the Twin Lakes District Medical Society held at Rockwell City, Iowa, June 19.

* * *

Physicians of the Abbott Hospital staff in Minneapolis held their annual picnic June 4 at the summer homes of Dr. Edward D. Anderson, Dr. Paul F. Dwan and Dr. H. M. N. Wynne, which adjoin each other on the Minnesota River.

* * *

Dr. Harold F. Wahlquist of Minneapolis was a member of the arrangements committee for the silver anniversary luncheon of the University of Minnesota Class of 1916. The luncheon was a part of the Alumni Day activities June 13.

* * *

Dr. Milton Starekow has become associated in practice with Dr. O. G. Lynde of Thief River Falls. Dr. Starekow is a graduate of Rush Medical college, and served his internship at St. Joseph's hospital in St. Paul.

* * *

Dr. Robert E. Priest is opening offices at 1008 Medical Arts Building in Minneapolis for the practice of otolaryngology. Dr. Priest has been a medical fellow in otolaryngology at the University of Minnesota Hospitals.

* * *

Dr. Robert Bowers of Mazeppa has moved to Lake City to practice with his father, Dr. Harry E. Bowers. The latter's partner, Dr. W. J. Cochrane, has retired. Dr. Robert Bowers is maintaining office hours in Mazeppa every afternoon.

* * *

A gift of $1,250 from the National Research Council for the study of "the relation of the pituitary to lipid and carbohydrate metabolism," has been granted the University of Minnesota. The study will be made under the direction of Dr. Leo T. Samuels of the department of physiology.

* * *

Correction.—Due to a mistake in typesetting an error occurred in the table on page 316 in the May 1941 issue, in the article on "Blood Tests to Prove Non-Parentage." The table there listed should have read as follows:

Groups	Cells (agglutinogens)	Serum (agglutinins)
O	—	a and b
A	A	b
B	B	a
AB	A and B	—

Guest speakers at forty-seventh annual meeting of the Utah State Medical Association held at the University of Utah in Salt Lake City, Utah, June 12-14, included Dr. Edward H. Rynearson of Rochester whose topic was "Hyperinsulinism; Endocrinology—A Critical Review."

* * *

When the twenty-fourth annual meeting of the American Broncho-Esophagological Association was held in Cleveland, June 3, Dr. Herman J. Moresch of Rochester presented a paper, "Further Observations on the Treatment of Esophageal Varices by Injection of a Sclerosing Solution."

* * *

A thief rifled the business suits of two Saint Paul physicians, June 7, while they were performing an operation in St. John's Hospital and obtained $260 in cash. The suits, which were left in a room adjoining the operating room, were those of Dr. Herbert L. Stolpestad and Dr. A. H. Stolpestad.

* * *

Dr. M. Rochae Silva, a fellow of the Guggenheim Memorial Foundation, has entered the Mayo Foundation in Rochester to work at the Institute of Experimental Medicine with Dr. C. F. Code. He is assistant in biology of the Faculty of Science, Instituto Biologico, University of Sao Paulo, Sao Paulo, Brazil.

* * *

Dr. Harry W. Christianson, assistant physician at the University of Minnesota Health Service, was elected a fellow of the American Proctologic Society at its annual meeting in Cleveland last month.

Dr. N. D. Smith of Rochester discussed papers presented at this meeting.

* * *

Among papers presented at the twelfth scientific meeting of the Association for Research in Ophthalmology held in Cleveland, June 3, was one by Drs. William L. Benedict and Edith M. Parkhill of Rochester, entitled, "Gliomas of the Retina: Histogenesis and Histopathologic Classification."

* * *

Dr. Charles W. Froats and Dr. Arthur Koepsell of Saint Paul are new diplomates of the American Board of Obstetrics and Gynecology through qualifying in the June examinations held in Cleveland.

Diplomates from Minneapolis include: Dr. John A. Haugen, Dr. Edward Maeder and Dr. Harold Leland.

* * *

Dr. J. A. Myers of Minneapolis was in his "home town" of Croton, Ohio, May 20 to deliver the commencement address at the Hartford High School. The occasion marked the thirty-fifth anniversary of Dr. Myer's graduation from that high school.

During May, Dr. Myers also gave several other addresses. He spoke before medical societies and tuberculosis associations in Harrisburg, Robinson, Springfield and Taylorville, Illinois, May 13 and 14. On May 6, he was in San Antonio, Texas, where he discussed a paper by Dr. L. Brahdy of New York City on "Tuberculosis as an Occupational Disease among Hospital Personnel," and on May 7 he conducted a meeting in San Antonio on the control of tuberculosis in the school systems of United States.

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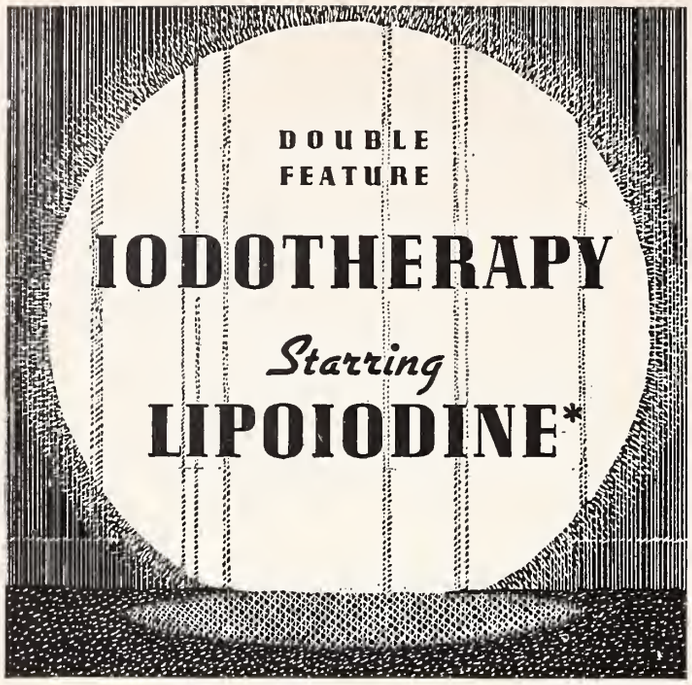
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Three members of the University of Minnesota School of Medicine, surgery department, were honored at a dinner by the University of Minnesota Hospitals surgical staff at Coffman Memorial Union, June 10. They are Drs. J. Frank Corbett, Harry P. Ritchie and Alexander R. Colvin.

* * *

Dr. C. W. Mayo was in Detroit, Michigan, June 11, to address the alumni of the Wayne University College of Medicine. On June 12, he was in Pittsburgh to address a meeting of the Pittsburgh Surgical Society. His subject for both meetings was "Malignancy of the Lower Portion of the Colon and Rectum; Combined Abdominoperineal Resection."

* * *

Dr. Walter C. Alvarez of Rochester attended a meeting of the Seventh Councilor District of the Medical Society of the State of Pennsylvania, held in Williamsport, May 9. His subject was "Puzzling Types of Abdominal Pain." He also addressed a joint meeting with the woman's auxiliary of the district on "Why Women Get Nervous."

* * *

Expected to return in August to the University of Minnesota Medical School is Dr. Charles E. McLennan of the department of obstetrics and gynecology. As holder of the Commonwealth Fund fellowship, Dr. McLennan has been studying problems concerned with the toxemias of pregnancy for the past year with Dr. E. M. Landis of the University of Virginia.

* * *

Principal address at the unveiling of Dean Cornwell's new painting, "Conquerors of Yellow Fever," in Cleveland, June 2, was delivered by Dr. Philip S. Hench of Rochester. The painting is the third in a series called "Pioneers of American Medicine."

Dr. Hench also attended the meeting of the American Rheumatism Association in Cleveland.

* * *

The Medico-Military Inactive Status Training Unit of the Mayo Foundation, scheduled for October 5 to 19 of this year, will be suspended during the present emergency, it is announced by Dr. Donald C. Balfour, director of the Mayo Foundation. On resumption of the school, notice will be published throughout the Corps Areas and Naval Districts.

* * *

A survey course in "Health Problems in Industry," will be presented at the Center for Continuation Study at the University of Minnesota, August 4 to 6. The course is for physicians, nurses and personnel managers, and will be concerned with a health program as it relates to physical examination, dispensary service, sick leave, hospitalization, safety education, hazards, sanitation, preventive medicine and public health.

* * *

The War department has authorized the granting of commissions as second lieutenant in the medical administrative corps to junior and senior medical students in good standing, without previous R.O.T.C. training. Upon completion of their medical course,

this commission will be canceled and a commission of first lieutenant in the medical reserve corps will be given.

* * *

The 1942 meeting of the American Federation of Clinical Research is to be held in the Twin Cities, according to tentative plans. Dr. Richard L. Varco, who represented the University of Minnesota chapter at the federation's organization meeting in Atlantic City recently, has been named arrangements chairman for the meeting and an ex officio member of the executive committee.

* * *

Dr. Ralph G. Ghormley and Dr. Harry B. Macey of Rochester addressed a meeting of the American Orthopædic Association in Toronto, June 9 to 12. Dr. Ghormley's paper, written in collaboration with Dr. M. B. Dockerty, is entitled, "Cystic Myxomatous Tumors About the Knee with Special Reference to Cysts of the Semilunar Cartilages." Dr. Macey's subject is "Amputation of the Lower Extremities in Occlusive Arterial Diseases: A Ten-Year Review."

* * *

To increase coördination of the services of 130 public and private welfare organizations in Minneapolis, a program of research and planning has been announced for that city. Representatives of various organizations will serve as volunteers to improve welfare services. Dr. Edgar J. Huenekens, president-elect and James H. Baker, executive secretary, have been named to represent the Hennepin County Medical Society in the division on health and medical care.

* * *

A paper by Drs. Fred Z. Havens and Edith M. Parkhill of Rochester was presented at the forty-seventh annual meeting of the American Laryngological, Rhinological and Otological Society in Los Angeles, June 16-18. Subject of their paper was "Malignant Tumors of the Larynx Other Than Squamous Cell Epitheliomas."

Dr. Bert E. Hempstead of Rochester also presented a paper, "Treatment and Prognosis of Aural Infections Complicated by Severe Diabetes."

* * *

The marriage of Dr. Eva-Jane Ostergren, daughter of Dr. and Mrs. Edward W. Ostergren of Saint Paul, to Dr. Bert Raleigh Larson of Minneapolis, took place June 25 at the home of the bride's parents.

The bride is a graduate of the University of Minnesota School of Medicine, and is a member of Alpha Epsilon Iota, professional medical sorority, and of Kappa Delta.

Dr. Larson is a graduate of the University of Minnesota School of Dentistry and is a member of Delta Sigma Delta, professional dental fraternity.

* * *

Grants in aid with which to continue important researches now under way, have been made to two members of the University of Minnesota Medical School faculty. Dr. Cecil J. Watson, associate professor and director of the division of internal medicine, has received $3,600 from the John and Mary R.

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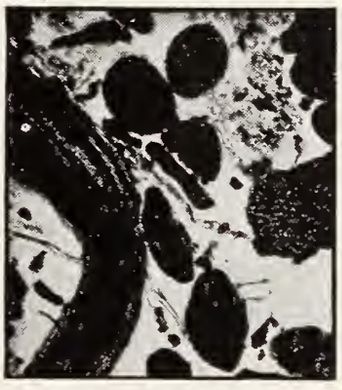
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FRACTURES & TRAUMATIC SURGERY—Two Weeks Intensive Course starting September 22. Informal Course every week.

GYNECOLOGY—Two Weeks Intensive Course starting October 20. One Month Personal Course starting August 25. Clinical Course every week.

OBSTETRICS—Three Weeks Personal Course starting August 4. Two Weeks Intensive Course starting October 6. Informal Course every week.

OTOLARYNGOLOGY—Two Weeks Intensive Course starting September 8. Informal Course every week.

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Markle Foundation to support his studies of "the significance of the excretion of various porphyrins."

To Dr. Arthur T. Henrici, professor of bacteriology and president of the American Bacteriological Association, the National Tuberculosis Association has granted $500 for a study of the relation of acid-fast actinomycetes to tuberculosis.

* * *

Institutes on premature and newborn infant care were conducted in eight Nebraska cities for physicians and nurses last month by Dr. A. V. Stoesser, associate professor of pediatrics at the University of Minnesota Medical School, and Miss Gertrude Carlsrud, nursing instructor in premature infant care, Minnesota State Department of Health.

The institutes, held from June 12-28, were presented under the auspices of the Nebraska Medical Association, the Nebraska Nurses Association, the Nebraska League of Nursing Education and the Nebraska State Department of Health.

* * *

Just released from publishers are two new children's books by Camilla Wing, wife of Dr. D. H. Bessesen of Minneapolis. The books, "The Shiny Scoop" and "The String Bean Horse," as explained by Dr. E. J. Huenekens, clinical professor of pediatrics at the University of Minnesota, in the foreword, "make the interesting attempt to solve the problem of poor appetite by educating the child to the value of the various foods and encouraging him to demand proper foods instead of having them forced on him." The little boy in the stories is "Dannie," and his little friends include Vitamin, Fat, Carbohydrate, Protein and Mineral.

* * *

A scroll for distinguished service was presented to Dr. and Mrs. Horace Newhart of Minneapolis at the Central Zone Conference for the Hard of Hearing.

The award was made at the conference banquet June 28, by Jerry Mihm of Saint Louis, vice president of the Central Zone, who presided at the dinner.

Dr. Newhart is director of the Division of Otolaryngology at the University of Minnesota Medical School, and a member of the sociey's board of directors. He twice served as president of the national association. Dr. and Mrs. Newhart were among the founders of the Minneapolis society, and Mrs. Newhart has served as its president.

* * *

Dr. Chester A. Stewart of Minneapolis, who left June 21 for New Orleans to become head of the pediatrics department of the Louisiana State University Medical School, was honored at several parties.

On May 28, members of the Northwest Pediatrics Society entertained at the University Club in Saint Paul and presented Dr. Stewart with a traveling bag.

His associates at the University of Minnesota pediatrics out-patient department entertained at the Campus Club in the Coffman Memorial Union, June 6. Dr. Stewart was presented with a gift.

On June 7, Dr. and Mrs. C. A. McKinlay of Min-

neapolis entertained at an open house for Dr. and Mrs. Stewart.

* * *

Dr. R. R. Hendrickson, who has headed the Buena Vista Sanatorium in Wabasha for the past year and a half, has resigned that position to accept a post as superintendent and medical director of the Sand Beach Sanatorium at Lake Park near Detroit Lakes. He will take up his new duties within the next month or two.

Before coming to Wabasha, Dr. Hendrickson was chief medical officer at the Saint Cloud reformatory and prior to that was superintendent at Fair Oaks Lodge Sanatorium, Wadena.

Dr. Hendrickson succeeds Dr. R. H. Flancher as superintendent of the Sand Beach Sanatorium, the latter having resigned recently.

* * *

Awards for outstanding scientific exhibits at the American Medical Association meeting in Cleveland were presented several Minnesota men.

The bronze medal for third place was given to Drs. Walter M. Boothby, W. R. Lovelace, C. W. Mayo and A. H. Bulbulian of Rochester for their exhibit on developments in aviation medicine, particularly research on the effects of oxygen want at high altitudes and the design of a rubber face mask to supply oxygen to military pilots.

In another group of awards made for excellence of presentation of medical work rather than original research, the gold medal went to Dr. Waltman Walters, Dr. Howard K. Gray and Dr. James T. Priestly of Rochester.

Among those receiving honorable mention were Dr. Thomas H. Seldon and Dr. John S. Lundy of Rochester.

Dr. H. S. Diehl, dean of medical sciences at the University of Minnesota, served as one of the judges of the scientific exhibits.

* * *

The most extensive scientific exhibit ever presented at an annual meeting of the Minnesota State Medical Association, was seen at the 1941 state session held in Saint Paul in May. Judges were hard put to confer honors fairly among the large number of uniformly excellent displays.

Winners of the Southern Minnesota Medical Association for the best scientific exhibit were F. T. Becker of Duluth and R. H. Puumala of Cloquet for their exhibit on Milker's Nodules. Special mention went to J. R. Sturre, Minneapolis, for his color photographs of gross specimens; F. C. Schuldt, Saint Paul, for his Introduction to Mendelian Law and Genetics; H. O. McPheeters and Harvey Nelson, Minneapolis, for their presentation of skin grafting; A. Louis Dippel and Emil G. Holmstrom for their Visualization of Placenta by Soft Tissue Roentgenography, University of Minnesota; F. E. Burch, Saint Paul, and Arthur H. Downing for their presentation of Malignant Melanomas of the Eye, University of Minnesota; R. K. Ghormley, E. F. Rosenberg and P. S. Hench of Roches-

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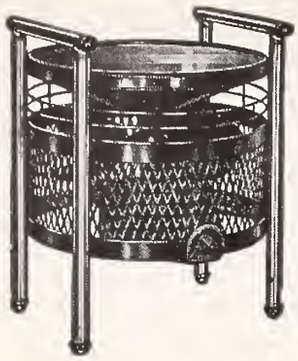
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ter for their showing of Types of Pathology of Rheumatic Diseases, Mayo Foundation of Medical Education and Research; Kano Ikeda for his exhibit on Lipoid Pneumonia, Charles T. Miller Hospital.

* * *

A recommendation that medical schools with adequate facilities increase their freshman class enrollment by 10 per cent in order to meet the increased demand for doctors resulting from the defense program, was voted at a recent meeting of the executive council of the Association of American Medical Colleges of which Dr. H. S. Diehl of the University of Minnesota is a member.

The council also recommended that in order to accelerate the output of medical schools, provision be made for part of the senior medical class to attend school during the summer months.

Both of these recommendations were in effect at the University of Minnesota, before the council meeting. It was voted some time ago to increase admissions to the medical school to 125 students—about 10 per cent more than have been admitted in previous years. For several years now, three-fourths of the senior class have attended school in the summer.

Ways by which the medical course, as a whole, can be accelerated without lowering standards, are being considered and will be discussed by the council next fall.

* * *

Medical Reserve Corps Officers ordered to extended active duty within the past few weeks include:

Dr. Carl John Fritsche of New Ulm, first lieutenant, to Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kansas.

Dr. Robert Sisson Leighton of Evansville, first lieutenant, to Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyoming.

Dr. Wallace Martin Meyer of Rollingstone, first lieutenant, to 30th Field Artillery, Camp Roberts, California.

Dr. Harry Bryan Neel of Albert Lea, first lieutenant, to Corps Area Service Command Station Hospital at Fort Leonard Wood, Missouri.

Dr. Donald Herbert Peterson of Saint Paul, first lieutenant, to Corps Area Service Command Induction Station, Fort Des Moines, Iowa.

Dr. Alvan Sach-Rowitz of Moose Lake, major, 40th Field Artillery, Camp Roberts, California.

Dr. Bernard Street of Saint Cloud, first lieutenant, to Corps Area Service Command Induction Station, Des Moines, Iowa.

Dr. Walter Subby of Hibbing, first lieutenant, Corps Area Service Command Reception Center, Fort Snelling, Minnesota.

Dr. William John Watson of Holdingford, first lieutenant, to Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kansas.

Dr. Richard Henry Barrett of Rochester, first lieutenant.

Dr. Samuel Alan Challman of Minneapolis, captain.

Dr. Christopher John McLoughlin of Rochester, first lieutenant.

Dr. Adolf Dysterheft of Gaylord, captain, to Cavalry Replacement Center Infirmary at Fort Riley, Kansas.

Dr. Joseph Samuel Emond of Farmington, captain, to 155th Station Hospital, Camp Roberts, California.

Dr. Erling Trygve Hauge of Minneapolis, first lieutenant, to 1st Cavalry Division, Fort Bliss, Texas.

Dr. Harold William Havel of Jordan, first lieutenant, to Field Artillery, 2nd Cavalry Division, Fort Riley, Kansas.

Dr. Cleon Richard Holland of Minneapolis, first lieutenant, to Corps Area Service Command Cavalry Replacement Center Infirmary at Fort Riley, Kansas.

Dr. Robert Davis Mooney of Saint Paul, first lieutenant, to Corps Area Service Station Hospital at Fort Leonard Wood, Missouri.

Dr. Donald Richard Reader of Fergus Falls, first lieutenant, to Corps Area Service Command Induction Station at Fort Snelling, Minnesota.

Dr. Charles Wesley Rogers of Heron Lake, first lieutenant, to Corps Area Service Command Engineer Replacement Center Infirmary, Fort Leonard Wood, Missouri.

Dr. George A. Williamson, Saint Paul, major, to Camp Haan, California.

MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 24 AUGUST, 1941 No. 8

A REVIEW OF FORTY-SEVEN YEARS OF SURGERY OF THE BILIARY TRACT*

ARNOLD SCHWYZER, M.D.
Saint Paul, Minnesota

A REVIEW of one's activity in some special field during a long period of time is of course always of interest to the reviewer himself. He can see where his shortcomings have been and compare his results with those of others. But to make such a study of any value for others, it is necessary to bring out some points which helped to improve the results (at least his) and especially to analyze the causes of failures.

Our first operation on the biliary tract was a cholecystostomy in 1894. From scanning over the records one can readily see that during the first years operations of this kind were rare and from the kind of operations one can recognize the fear of very active surgical interference. Surgery of the biliary system in those early days was not undertaken light-heartedly, as we did not have the blessings of the x-ray. The diagnosis was much more difficult, and numerous cases were not recognized. Cholecystostomy was considered preferable to ectomy in the average case and A. J. Ochsner of Chicago, a most excellent and level-headed surgeon, was much in favor of the conservative cholecystostomy. This operation was even often done in two stages. It was not known whether the removal of the gall bladder would not cause functional disturbances or later on even permanent liver damage. Experience, of course, has settled this long ago. My first patient to receive a cholecystectomy, for instance, is hale and hearty today after forty-one years, at the age of seventy-six. The first patient with common duct stones, from whom I heard recently, is very well at eighty years of age, thirty-nine years after a cholecystectomy and choledochotomy for calculi.

In 1905 the "ectomies" began to be as frequent as the "stomies" in our records and thereafter cholecystostomy became exceptional.

Most of the early operations were for stones. Gradually the "cholecystitis sine concremento" was recognized. During the ten years following my first gall bladder case in 1894, I had nineteen operations on the gall bladder or the ducts. It seemed to be of some historic interest to look them up more closely. Among them was an empyema of the gall bladder which was drained. Another was a gall bladder-colon fistula where an intraperitoneal abscess contained stones, pus and feculent material. The stones were removed and the parts drained. The fistula closed after a while. Another case was of interest on account of the large number of stones. These were quite small, about 1.5 mm. in diameter, but of beautiful tetrahedral shape. A good many of them were lost on the gauze sponges, but a nurse was asked to count what we had collected in a cup. She reported 5,970 of them. I recollect that Osler mentions as many as 2,000 and speaks of another unauthenticated report of 6,000. The stones in our case were removed by a cholecystostomy in 1901. In December, 1924, twenty-three years later, this patient had to be reoperated upon. The gall bladder was about five inches long and again brimful of stones, a larger one in the neck of the gall bladder being the size of a large cherry. The gall bladder was, of course, removed this time. A portion of the abdominal wall was resected in one piece with the gall bladder as it was found thickened around

*President's Address presented before the Saint Paul Surgical Society, May 8, 1941.

a small abscess. Near the fundus a carcinoma had formed in the part which was attached to the abdominal wall. Later on a recurrence took place in the abdominal wall which was excised repeatedly, the last time in June, 1926. She died later on. That the carcinoma was located near the drainage stoma is of significance.

Another one of the cases of the first ten years was an ascites with icterus. The gall bladder was drained and an omentopexy (Talma) was done on October 12, 1901. She left the hospital much improved. The only later entry I could find was of March 15, 1902. It reads "Icterus and ascites completely gone." This was one of the best results we ever had with the Talma operation, as in several other cases the results were mostly insignificant or bad.

Our first cholecystostomy, as mentioned, was done in 1894, the first two cholecystectomies in 1900, and the first two choledochotomies in 1902, all for stones. Among these cases up to December, 1903, sixteen were marked as cured and three as much improved. The classification "cured," I am afraid, must be taken with some reserve, inasmuch as late conditions could often not be traced after this long time. I know at least of another patient besides the one mentioned before on whom I had to remove the gall bladder years later. The fear and indecision which marked these first years of our gall-bladder work are illustrated by two cases in which we performed only a cholecystolysis, freeing old adhesions in which the gall bladder was imbedded. One of these had a Loretta stretching of the pylorus at the same time and reported herself as "very well" fourteen months later. The other had an appendectomy at the same time. Of the remaining seventeen from 1894 to 1903, inclusive, there were: Ten cholecystostomies for stones; one cholecystostomy and Talma's omentopexy for jaundice and ascites; two cholecystectomies for stones; two cholecystectomies and choledochotomies for stones; one choledochotomy for stone in a case of biliary fistula; one a gall-bladder-colon fistula with abscess with removal of stones and drainage.

There were no deaths in these first ten years. However in the next hundred cases there were three deaths but because later gradually more serious conditions had to be taken care of, the total mortality reached practically 4 per cent. While at times there were many cases up to more than eighty in succession without a death, there came from time to time dark days, when some desperate situations confronted us, or when unforeseen or unforeseeable accidents occurred. The following is the list of deaths, thirty-nine in all among the 998 cases in our private practice from 1894 to April, 1941:

CAUSES OF DEATH

1894 to April, 1941

Pulmonary emboli	8
Brachial artery embolus and deliria	1
Ileofemoral embolus	1
Hemorrhage in cerebral ventricles	1
Carcinoma of pancreas or common duct	5
Uncontrollable vomiting	1
Bile peritonitis, pre-operative	1
Acholia after duct drainage (duct stones)	1
Pericholecystitic abscesses with sepsis	5
Influenza peritonitis	1
Peritonitis after abortion	1
Peritonitis starting from old pelvic infection	1
Peracute cholecystitis and pancreatitis	1
Acute cholangitis and general sepsis (pre-operative)	1
Shock (liver shock?)	3
Acute septic hepatitis (pre-operative)	1
Angina pectoris	1
Myocarditis in old severe icterus	2
Renal insufficiency and exhaustion, operative damage to main duct	1
Anuria	1
Pneumonia	1
Total	39

In looking over this rather long list one notices that embolism, carcinoma cases and various infectious conditions play the principal part, but there are also a sizable number of rarer occurrences.

Pulmonary Embolism.—This seems to happen more frequently after operations on the biliary tract than in most other areas except perhaps after those for large uterine fibroids. It is much dreaded by all surgeons, particularly because without premonition it strikes out of a clear sky, and our defense against its happening is poor. In our records it happened once on the fifth day; in the other seven between the ninth and eighteenth day. The chemical means to counteract thrombosis are not practical so far, because it is necessary to keep up a continuous intravenous flow of a heparin solution for many days. Pulmonary embolectomy has been successful a number of times especially with Nystrom and

Giertz of Sweden, but requires a constantly ready set of instruments and before all a very competent and specially trained resident surgeon. In a moderate sized hospital this is out of the question. We others have, therefore, to think first of reducing the incidence of this disaster. In this resignation, it seems to me, we are justified if the occurrence of an embolus can be rendered sufficiently rare. In our last 200 operations on the biliary system we had only one fatality from this source and this occurred in a simple cholecystectomy and appendectomy finished in thirty-five minutes. To avoid clotting in the veins mechanical assistance to the circulation is most important. The patient has to be moved from side to side frequently. When the patient is awake this is done hourly. In addition the legs are bent and stretched three times every hour, at least in part actively. An incision for the abdominal walls which we published in 1934 (*Western Journal of Surgery,* April, 1934) allows the patient to turn as a rule actively very soon after the operation with much less discomfort than with a straight vertical mid-rectus incision. The patient can be taken out of bed even on the day of operation if desirable as in inability to urinate while lying in bed. The main feature of the procedure is a right mid-rectus incision where the posterior rectus fascia is split horizontally on distracting the rectus muscle far laterally. The incision is carried a good distance into the transversus muscle and mesially at least to the midline or a little beyond. If more room becomes necessary one can incise the transversus muscle far laterally up- or downward as it may seem appropriate. It is quite true that one has not as much room as with the straight up and down incision and for this reason our incision may not be desirable when difficult work on the deep channels is anticipated. In the last 200 cases we have however used the straight up and down incision only three times. Eight colleagues were operated upon for gall-bladder trouble and those with this incision were impressed with the fact that they could be taken to the bathroom on the day of operation and as a rule sit up in a chair in two or three days. The patients can move about more or less actively, which is better than passive motion as it will be done more frequently.

Peripheral Arterial Emboli.—These are rare occurrences, but in the long run will happen now and then. They are due to a thrombus torn loose from a pulmonary vein or more often from the left auricle. A most beautiful specimen illustrating how even an embolus from a peripheral vein may enter the peripheral arterial tree by way of a persistent foramen ovale existed in the pathological collection of the University of Geneva, Switzerland. One arm of the forked embolus was firmly wedged into the foramen while the other two kept the embolus from passing through and could be seen sticking out in the right auricle. One of our patients who got a brachial embolism with a cerebral complication is an example of some surgical dilemmas. This patient, a man sixty-four years of age, has had a stroke a little over three weeks before, which paralyzed his left side. He had partially recovered from this when jaundice, nausea, and distressing vomiting with tenderness over the gall bladder supervened. He must have relief. His very competent physician favored operation. Spinal anesthesia was used so as to avoid any rise in blood pressure. The gall bladder was excised and three large calculi were removed from the common duct. On the morning of the sixth day after the operation, the patient was taken up in a chair on account of very distressing asthma from which he had suffered for months. The nurse reported that he cried because he said he was so happy. The highest temperature for the four preceding days was once 99 degrees. At 4 p.m. of that sixth day he suddenly got an embolus in his right brachial artery which within three days resulted in a necrosis of the thumb. He became delirious, developed a high fever and died. Another patient presented a similar picture from an embolus into the femoral artery.

Cancerous growths of the pancreas or common duct were not infrequently encountered. Even when the diagnosis could be made beforehand an unbearable itching would make operation advisable. Five such patients are included in this report. They either died in the hospital or soon afterward. If the patients went home feeling distinctly improved their deaths which followed of necessity later on were not counted. A recent case may be mentioned as an example. Some twenty odd years ago I had resected a woman's cecum and ascending colon for carcinoma; four years ago we had to resect her stomach for carcinoma. Then she came home

from California deeply jaundiced with but little pain but an insufferable itching and scratch marks all over her body. Draining of the gall bladder relieved her from the itching within three days, and the jaundice cleared up. She was aware of her condition but left for home most grateful for the relief.

A case marked *acholia* belongs really in this group of cancers. Jaundice had existed for a long time and no bile came forth after a cholecystostomy. (Four other patients with white bile due to obstruction by calculi got well.)

Bile peritonitis was seen in one patient who was operated upon when already in a precarious condition. The abdomen was found full of bile, but the place of leakage could not be determined. The bile was sucked away and a cholecystostomy was made, but did not help.

One fatality is recorded in 1916 as due to incessant *uncontrollable vomiting,* followed by utter exhaustion. No further data could be found.

Advanced infectious states with pericholecystitic abscesses and with general septic conditions of which a good number were saved are nevertheless represented with five deaths. For instance in 1927 a seventy-six-year-old lady was brought into the hospital with abscesses around a partially necrotic gall bladder with stones. The gall bladder was removed and ample drainage instituted, but while locally the condition was finally quite good, she died thirty-three days after the operation from general sepsis. Colon bacilli were cultured from the blood. All five patients came much too late to operation. A drastic example which is very instructive presented itself in 1937. This patient, a farmer sixty-four years of age, had been lying in a hospital for five weeks under the care of a good surgeon. The chart showed temperatures up to 105 degrees with daily chills preceding. His surgeon had considered the condition too dangerous for any operative interference and at least in the start apparently had hoped for a let-up. It is still the teaching by conservative authorities that one should wait in cholecystitis until the acute process has cooled off. When I was asked to see this man at the end of these five weeks, the abdomen was very much ballooned clearly from peritonitis. In the presence of this unabating high fever and the daily severe chills I felt a chance ought to be given this man, whereupon the case was turned over to me. This was done kindly and —it seemed—gladly. The only somewhat encouraging feature in the frightful picture was that the patient had been able to live through this infection that long. We found a large amount of free thin flaky pus of a repulsive sweetish odor, a partially walled off necrosing gall bladder filled with pus and stones, and in addition a liver abscess. Orange colored pus with a considerable amount of grumous brownish material escaped from a slit-like opening in the liver near the hepatic duct. The gall bladder was removed and the abscess drained. After two weeks of very encouraging improvement the temperature rose again to higher levels. The patient died fifty-four days after the operation. The autopsy revealed multiple liver abscesses and also a lung abscess. This case is a strong argument in favor of prompt active interference in acute cholecystitis. For a good number of years we have followed this principle and have no reason to regret it. If peritonitic symptoms are not abating within twenty-four hours or even much less in serious looking cases, operation is resorted to. If the picture somewhat improves we usually wait a day or two or even three, but only if there is a steady easing up. In more or less advanced acute infections there will always be some mortality in the long run, but in *early acute cholecystitis,* of which we had a good many, our records do not show a single death from peritonitis which we judged to be due to a spreading of the infection from the field of operation. This may well be purely good luck, but it shows that the danger in spreading the infection in cholecystitis by operative interference is surely very small. And at that we have most always removed the gall bladder even in very acute cases.

All this does not say that perhaps cases registered under shock or the one listed as uncontrollable vomiting did not have a certain degree of peritonitis in addition, but they did not die of it. The patient with peracute cholecystitis with pancreatitis and an acute cholangitis did not die of peritonitis but of a general sepsis with which he came into the hospital.

However, there are three deaths from peritonitis in our records. One, to all appearances, was an influenza infection during a severe epi-

demic. There were several grave cases of influenza in the hospital at the time. The other two, however, had a frank postoperative peritonitis, starting in both from the pelvis. One of them after operation had a miscarriage which seemed spontaneous, but what had happened beforehand we do not know. The other patient years previously had undergone somewhere a salpingectomy for infection. A painful and fixed ovary was removed and cord-like pelvic adhesions were divided at the time of the cholecystectomy. The postoperative course left no doubt that the old pelvic infection had flared up again. These three incidents of peritonitis were all in previously afebrile, apparently clean, cases. The last one mentioned furnishes the important lesson that it is not safe to operate at the same session on two conditions in the abdomen if they are too far distant from each other. Either the incision has to be unduly large or the exposure is insufficient. A patient with a large fibroma of the uterus had a hysteromyomectomy and the gall bladder, full of stones, was removed at the same time. She was one of those who are listed as having died of embolism. Since this accident we have divided such procedures into two separate operations. Only in one other similar case did we deviate from this. There was a single round calculus in a long freely movable gall bladder. After the hysteromyomectomy a separate 1.5 inch incision was made over the gall bladder which was brought into the wound by the hand in the abdomen and grasped by some forceps. Through a nick in its wall the stone of marble size was forced out by the hand in the abdomen. The gall bladder was then closed by inverting sutures; in other words a cholecystendysis was done. Healing occurred without incident.

The three cases of peritonitis reported were the only ones where death occurred from this source. They demonstrate that acute cholecystitis, even gangrenous, creates much less danger from a generalized peritonitis than from general sepsis. Therefore out with the gall bladder as quickly as possible. This is well illustrated by the next case:

A woman with very acute cholecystitis with stone impaction and pancreatitis died of general sepsis while the local condition had become surprisingly good after the operation. On the other hand it stands to reason that even early operation may not avert a fatal outcome in inaccessible or overwhelming sepsis, as in a woman who was brought in with an acute cholangitis and fever of 104.6 degrees. Drainage of the common duct did not help—may we say—any more, or was the fate sealed from the start?

We now come to the group of three cases marked as *shock*. Two of these allow of no further specification; they date back to 1921 and 1927. The autopsy in one was negative, in the other myocarditis is mentioned in the protocol. A third one was of recent date (1939) and the notes are more complete. This patient, a very thin worn-out woman of seventy-one years, came with a carcinoma of the fundus of the gall bladder. It had grown into the adjoining parts of the liver. Because the duct area was not involved we removed a triangular wedge-shaped portion of the liver together with the gall bladder. The piece of liver after removal measured 12x10x3 cms. Bleeding was quite moderate. Before cutting the liver the duct was divided and tied. Then catgut mattress sutures were placed through the thickness of the liver and tied over rubber tubes, one above and one underneath the liver. When the liver was cut the assistant's hands kept the liver moderately compressed and the larger vessels were readily grasped and tied. All this went quite smoothly under good spinal anesthesia. However, the postoperative course was an entirely different story. In the night following the operation the temperature shot up to reach 105 degrees in the early morning, and the patient died within twenty-four hours after the operation. There was no cause locally to be made out. We took it for *"liver death,"* as reported in the literature—whatever that may be. In two similar surgical procedures for carcinoma of the gall bladder with sizable resections of the liver the operation was stood quite well.

In 1924 Heyd was the first to describe what he called liver death. Since then a good number of publications on the subject have come out. The picture is characterized by a very rapid development of high temperatures within eighteen to thirty-six hours after operation, a fall in blood pressure, circulatory collapse, coma and death. The temperature may reach 109 degrees. The only pathological finding which could be demonstrated was passive hyperemia and a diffuse disintegration of the parenchyma in the

softened liver with numerous foci of necrosis. The process is not yet sufficiently understood; a toxin is supposed to have formed. The underlying cause of the damage to the liver parenchyma was also thought to be a traumatism during or preceding the operation. Experimentally similar pictures were seen in ligation of the hepatic artery of dogs. In the human, damage of one kind or another to the hepatic artery such as emboli or thrombosis is practically unknown. The theory was then put forth that it might be a severe spasm of this vessel in an already damaged liver. A peracute bacteremia was also considered, but we know nothing further about it.

The next case on the list is classed as an *acute septic hepatitis.* It was not so much a cholangitis as a generalized septic condition with partial ileus, some moderate icterus and a large liver. Cooler judgment might have kept us from interfering surgically. But the patient was a physician whom we all liked for his kind and happy disposition. I mention this purposely. When I first saw him in consultation he was barely semiconscious, had a greatly ballooned abdomen, a high fever and a distinct degree of jaundice. The diagnosis was not sufficiently clear. Was it a common duct obstruction with cholangitis or a septic hepatitis with partial ileus? I suggested one might try the last thing, draining the bile channels, and my colleague, who had seen more of the patient and had his misgivings, asked me to do it, he assisting. A simple cholecystostomy was done as the gall bladder was full of bile. The outcome was as he had foreseen, and I had been fighting not to see, at least not so definitely. In private practice—and all my cases were such—one is at time induced by sentimental reasons to try what on cool judgment would be ruled out. This also depends much on the temperament of the surgeon and on his former experience.

An occurrence, dating back to my early surgical days in the nineties has remained fresh in the memory. A middle-aged strong man was brought to the hospital with a fever over 104 degrees and deeply jaundiced. He was in a maniacal state and unconscious, yelling and throwing himself around in the bed. This had started quite acutely a few days before. I showed the patient to some of my colleagues as a classical picture of acute yellow atrophy of the liver. The very acute onset, the very high fever, and the surprisingly deep jaundice after such a very short time seemed to clinch the diagnosis. He died within about three days after entering the hospital. The autopsy demonstrated a round stone at the ampulla the size of a large pea. The liver was very large, but I cannot find the microscopic slides any more. From the course of the illness I am still inclined to think it was an acute yellow atrophy with its hopeless prognosis, induced perhaps by the sudden obstruction. But it still has the effect on me as an error of omission.

The next item on the list is angina pectoris, represented by one death three weeks after the operation, a cholecystectomy. Coronary symptoms and gall-bladder diseases often have a very definite interrelation. I have followed this for many years. I have seen clear-cut coronary conditions which killed patients a short time later, where there was a very exquisite local tenderness over the gall bladder even on quite gentle palpation. Though what I am going to say is only speculation and must be investigated properly by some competent internist, the frequency of the combination of symptoms from both these organs, heart and gall bladder, cannot be overlooked. At the very moment of writing these notes I have two patients in the hospital on whom we removed the gall bladder for impacted stones. Both had been treated for heart trouble, one for several months, while the other had recently been in a hospital for five weeks on account of her heart. Both are distinctly improved since the operation. Heart and gall bladder have their innervation from the vagus and the sympathetic. If one studies the grave and sudden spasms and inhibition reflexes in traumas of the chest one becomes impressed by the enormous importance of these reflexes. Constantini of Algiers gave the best discussion of the subject I personally have heard, at the International Congress of Surgery at Brussels in 1938 (*Journal Internat. de Chir.,* 1938). It is very conceivable that a chronic infection of the gall bladder may cause myocarditic changes and that an acute impaction of a stone may bring on spasms in the coronary system. Myocarditis in severe icterus of long standing is given as cause of death in two cases. The long delay before operation had undoubtedly much to do with the fatal outcome.

In the table of our fatalities now comes a case entered as "Renal insufficiency and exhaustion after operative damage to the main duct." Here we have to confess to a technical error, the memory of which remains painfully vivid after thirty-one years. It was a cholecystectomy, done as was the rule in those days, and is done by many today, from the cystic duct outward. The wound healed and the patient left for home in the country. Everything seemed in order. Two months and five days after the operation this woman returned to the hospital in a well nigh desperate condition. There was a moderate icterus, surprisingly moderate for what we then found. She was very weak, had pain in the upper abdomen. The temperature was 98 degrees. The specific gravity of her urine was 1.002 and contained a trace of albumen. On reopening the abdomen we found a pool of bile, fairly well walled off. An injury to the common duct had occurred at the operation. Apparently a small slice of this duct had been cut away. Chromic catgut had been used and leakage, it seems, started only weeks later when the catgut gave way. An anastomosis between hepatic and common duct was made, but the patient weakened out promptly.

In another similar instance we were fortunately aware of the accident at the time of the operation. The gall bladder with the greatly thickened cystic duct was removed and in the bulk of the inflammatory mass around the cystic duct was the whole length of the hepatic duct. A catheter was then inserted to splint the parts which could not be brought together in a satisfactory manner. For this reason it was intended to leave the tube in place as long as possible. One end of the catheter, cut off on a slant, was pushed into the left hepatic duct and the tip of the catheter inserted into the common duct and through it far into the duodenum. A roentgen plate showed it to reach the duodenojejunal junction. The wound healed and there was no discomfort from the tube which was seen by x-ray repeatedly to have remained exactly in the original position and to be free from recognizable incrustation. We figured, the longer we could leave the tube in, the safer we would be from a subsequent stricture. At the end of two and a half years some fever and discomfort set in and the tube was removed transduodenally. Bacteriologic examination yielded a practically pure culture of bacillus gracilis. This woman is now eighty-eight years old and had her operation at the age of sixty-nine. She was reported recently to be well and very active though she had a slight stroke of apoplexy a few years ago.

Since this last accident we have changed the technique of cholecystectomy by starting at the fundus.

The list of our failures closes with a case of anuria in a seventy-year-old man and one of pneumonia also in a seventy-year-old man. This latter happened in 1904 after a cholecystostomy under ether anesthesia. It is not only the single pneumonia death in these records, but no other frank pneumonia has occurred. This is a fortunate fact for which all credit must go to our most conscientious and competent anesthetist, Miss Marie Gronvold, who has worked with us since 1898. From 1930 on we have used almost exclusively spinal anesthesia by the method I described in Minnesota Medicine, December, 1930.

It was thought that a report of the fatalities, thirty-nine in 998 cases, would be of more interest than anything I might have to say, and we therefore gave it most attention. As to the technique, we have for many years closed the wound tight where drainage was not imperative, probably in 60 per cent of all our cases in the last fifteen years. Even in operations during an acute attack of gall-stone colic the abdomen is closed without drainage more often than not. However, it is not wise to set hard and fast rules, and above all it is necessary to feel safe against leakage of bile. For this reason it is of great value to leave as much connective tissue on the liver side as feasible, a point recently advocated, but practiced and emphasized by us for nearly twenty years. Even with this careful procedure it is necessary to look closely for any possible leakage of bile. This is done with a gauze sponge, left in place for a little while after all oozing has stopped. Once I noticed a whitish cord, like a small artery of about two millimeters in diameter, at the edge of the gall bladder bed midway between fundus and cystic duct. On watching it, we could see bile escape from it.

Remembering the French saying that "the art of boring an audience is to be complete," I will only mention a very few technical points. First I want to describe in short a form of cholecysto-

gastrostomy or cholecystoduodenostomy which gave us the impression of neatness and simplicity. If the gall bladder is rather normal though distended as so often in carcinoma of the pancreas, the contents are first aspirated and two continuous sutures bring the selected areas of the gall-bladder ampulla and the chosen gut together. Now a Hegar uterine dilator of the size of a little finger is pushed into the gall bladder through an opening barely large enough for it. Thus leakage is prevented (though uninfected bile is harmless, and after mopping it away it need not prevent one from closing the wound tight). The metal rod is then made to bulge at the ampulla of the gall bladder directly in front of the sutures. A nick allows the rounded end of the rod to emerge and a nick in the gut permits it to enter it airtight. The inner of the continuous sutures then catches the edges of the nicks and the second suture grasps the peritoneum not too close to the inner suture. Before removing the rod a large sized catheter is prepared. The distance to which it is desirable to introduce it into the gut is measured and at an appropriate place a side opening is cut to rest in the lumen of the gall bladder. The catheter can remain as long as desired and if sufficient inverting suturing was done it can at any time be removed without leakage following. One might even claim that this method is better adapted to avoid cholangitis, which is a serious complication, often following the usual kind of anastomosis with the fundus of the gall bladder. In this latter case peristaltic contraction of the gall bladder will force intestinal contents, which have entered, toward the deeper bile channels. With our modification the tube gives good protection while it is in place, and after its removal muscular contraction has the tendency to force the gall-bladder contents through the stoma back into the gut.

Let me mention some important points in the draining of the common duct. In case a T-tube is used, possible difficulty on removing it later is obviated if the crosspiece which is to lie in the duct is transformed into a simple trough by cutting half of it away lengthwise. It then doubles up more readily on withdrawal. If an ordinary rubber tube or catheter is used it should not be inserted up toward the liver as it is the trend to do, but in the downward direction. At the proper place an extra hole is cut in it. If the tube is inserted upward, the lower part of the opening in the duct is compressed by the slantingly entering tube while the upper area is stretched. On withdrawal later on, the bile wells freely into the wound, but the distal duct opening is more or less rigidly held in a slit-like manner. The degree of rigidity of this lower whistle-shaped opening depends of course on the length of time the tube was left in. On the other hand, if the course of the draining tube is downward, the bile on removing of the tube finds no difficulty in escaping the slit-like upper opening and is now readily received by the funnel-shaped lower opening. A troublesome biliary fistula is thus avoided. The bile has in this procedure naturally the tendency during the first days after the operation to leak into the wound, but this has little importance if the wound is properly drained and the patient is kept in prone position for at least twenty-four hours. By this time the parts are walled off, enough to permit at intervals a right-sided lateral position.

Among the many unusual findings which everybody encounters in the long run, two cases come to memory, which I may be permitted to add in short. One was a gall bladder which contained two and a half liters of thin pus. The hand and half of the forearm introduced into this sac which was adherent everywhere could readily palpate the right kidney and the neighboring structures.

In another instance we found a beautiful blue gall stone about an inch in its longest diameter. It was clearly an indigo calculus. It came from a gall bladder with a foul smelling content due to colon bacillus infection. The explanation must be looked for in the decomposition of proteins with the formation of tryptophane. Tryptophane is indoxyl-aminopropionic acid. It is freed out of the proteins by fermentative disruption of the protein molecule. Through bacterial putrefaction tryptophane goes over into indoxyl. The indoxyl in the presence of oxygen is changed into indigo blue. I remember reports of renal calculi composed of indigo, but I have not run across a report of a blue gall stone.

In summing up our observations it may be stated that in going through the material, comprising a period of forty-seven years, some surprises awaited us, as for instance the absence of any mortality during the first ten years. On the other hand, bad and desperate cases came

later on at times, to raise the total mortality to almost 4 per cent. This includes hopeless cases where an operation was done only to alleviate the last remaining days of life. Such cases might in all fairness be excluded from a mortality statistics, but I wanted to give you the full picture without any manicuring. Sure enough, we had repeatedly long intervals without any failures, but apparently there are few summers without lightning.

What does the review of our material tell us?

(1) Pulmonary embolism has become decidedly rarer since the patients are made to move about and to move their legs, actively if at all possible, hourly during the wake hours. The patients are explained the importance of it. Our abdominal incision makes them move about in bed with much less pain.

(2) There will always be instances where only palliative measures are possible and others where poor conditions of heart and kidneys are prone to lead to disaster. Errors of omission or commission will depend to a certain degree on the individuality of the surgeon.

(3) Most important, the survey of our material showed that *postoperative* peritonitis, even in acute cholecystitis, is almost negligible with proper management, while on the other hand a septic condition exists quite frequently before operation. Even a gangrenous cholecystitis creates much less danger from a generalized peritonitis than from general sepsis. This urges us not to delay operative measures even in very serious states of infection. In grave septic cases failures will often be unavoidable, but we may also frequently save a life otherwise hopelessly lost. Under such conditions, who would bother about statistics!

TUBERCULOSIS IN THE SILICOTIC SUBJECT*

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CERTAIN American clinicians have been questioning the classical concept that a high tuberculosis rate is an essential part of the picture of silicosis. They point out that the roentgenographic patterns that have been described as characteristic of tuberculosis are too often unassociated with either pathognomic symptoms or the presence of acid-fast organisms in the sputum to warrant such an assumption. A few objectors have reported autopsies in which no trace of tuberculosis could be found in the lesions in question. I shall present evidence which, I think, explains their difficulties and shall reaffirm my faith in the fundamental teaching of the South African School. I shall indicate that in most of its stages silicosis does increase native susceptibility to the tubercle bacillus but that after the reaction to silica has healed such alteration need no longer exist. I shall also recall that there can be no tuberculosis without the tubercle bacillus and hence the amount of infection in a silicotic group, like that in any community, will be governed by the number of carriers. Finally, I shall cite evidence for believing that tuberculous infections in a silicotic subject may heal, particularly under the influence of certain other mineral particles inhaled in association with free silica.

The original concept, that silicosis specifically predisposes to tuberculosis, is founded upon an impressive body of clinical and pathological observations eminating from the Miners' Phthisis Bureau of the Union of South Africa. Their figures indicate that of the old silicotic gold miners who died and came to autopsy approximately three-quarters showed evidence of associated tuberculosis. Similar findings have subsequently been reported in industries in this country which produced dusts of high silica content. Such, for example, was the experience in the Joplin lead and zinc mines and the Barre granite industry. Pathological investigations from various places have offered confirmation. In a large series of

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autopsies reported by the Medical Research Council of Great Britain, tuberculosis was discovered in 65 per cent of the cases with silicosis. In the experience of the Saranac Laboratory, tuberculosis complicated 60 per cent of the lungs of persons who had been exposed to various dusts of high quartz content. Among those who had inhaled minerals of other kinds tuberculosis occurred in only 15 per cent.

Animal experimentation has demonstrated a specific alteration of native susceptibility to tuberculous infection that is not produced by minerals other than quartz and similar forms of free silica. Strains of tubercle bacilli that are incapable of causing progressive tuberculosis in normal animals of different species provoke chronic and often fatal infections when introduced into silicotic animals. This has been the usual outcome with silicotic guinea pigs infected with the attenuated strain of tubercle bacillus, R_1, and in silicotic rabbits inoculated with small doses of human type bacilli. An experiment first performed by Kettle has demonstrated clearly that the necrotic tissue produced by a local injection of a sufficient quantity of fine silica particles provides a medium upon which tubercle bacilli multiply very rapidly. This effect does not follow unless four or five days are allowed to elapse between the injection of the silica and that of the bacteria. Therefore it is the tissue reaction to the silica rather than the presence of the mineral particles which stimulates growth of the organisms. Neither Kettle nor various investigators in the Saranac Laboratory have been able to obtain consistent verification of the observation of Price that the addition of silica to culture media stimulates the growth of tubercle bacilli. Probably emphasis should be laid on the silicotic *necrosis*, for older lesions which are composed of mature scar tissue with calcification of necrotic elements seem to have much less effect upon bacterial proliferation. Kettle also showed that necrosis caused by other irritants, like croton oil, does not favor growth of tubercle bacilli and Vorwald and Landau proved that a variety of silicates and non-siliceous minerals are equally ineffective.

Finally, experiments have shown that in animals made to inhale mixtures of quartz and other minerals, such as iron oxide, R_1 infections may progress to involve large areas of the lungs and then heal leaving extensive fibrous scars. In animals surviving for several years histological evidences of the original tuberculosis are often hard to discover. Where still present they may be localized to small foci in the widespread fibrous lesions.

Returning to the clinical field, it should be noted that the classical studies on silicosis which formulated our concepts of this disease, were made in old, long-established industries, usually isolated in rural or mountainous districts. The industrial populations were stable or at least composed of specialists who would only migrate from one location to another where similar work was to be had. The rocks being manipulated were of high free silica content, usually in excess of 30 per cent, and dust was produced with little or no effort to control it. A fatalistic complacency decreed that a man should work until disabled, by which time no x-ray was needed to discover evidences of tuberculosis. Sputum examinations demonstrated the presence of many open carriers. In fact, the tuberculosis which served as an indicator of the silica hazard could not be concealed.

In contrast to such pictures, the general application of mass survey techniques is revealing silicosis that has developed under very different circumstances. Many of the plants are located in large cities where tuberculosis control programs are in effective operation. Unskilled laborers move from job to job where they may be exposed for short periods to any number of industrial dusts, some dangerous, others perhaps leaving only shadows on an x-ray film as evidence of exposure. All members of a group are now being examined and we see evidences of the early as well as the late stages of disease. Tuberculosis is recognized earlier and the carriers are eliminated. The concentration of dust in places of work is being reduced. Few autopsies are obtained upon men dying with minimal dust reactions and those that are may be misinterpreted by general pathologists unfamiliar with industrial environments. Our concepts of the disease process are based upon roentgenographic shadows and not upon pathological tissue reactions.

Naturally, under modern conditions we will not find as much tuberculosis because the opportunities for infection are being reduced. Fewer persons with latent infections now enter the dusty trades and the open carriers are being hospitalized. Infections are being discovered in pre-

clinical stages just as they are in the general population. Presumably the predisposition still exists but without contact with infection at the proper time tuberculosis cannot develop.

The general practitioner and internist who see only an occasional case of silicosis, and this perhaps in an advanced stage, have a different impression of the disease than the industrial physician who in one industry has had opportunity to observe the evolution of a particular type of silicosis and associated tuberculosis. The latter, by serial films taken year after year, sees the disease process develop in dozens of individuals; he recognizes that in normal lungs silicosis is manifested as a generalized discrete nodulation and to him any localized conglomerate shadow suggests a complicating infection. Clinical symptoms of such infection may be lacking for prolonged periods but in time, perhaps years later, he has seen many conglomerate lesions break down and then the symptoms of tuberculosis become apparent. Autopsies on these cases have substantiated the nature of the localized infection.

Long observation of experimental and human pathological material have confirmed my own belief that the silicotic subject in most cases is more susceptible to tuberculosis than the normal one. But experience with animals leads me to suspect that when the silicotic fibrosis has passed the stage of greatest activity susceptibility to infection also wanes. This would explain certain cases, to be mentioned below, in which tuberculosis behaves typically in a silicotic host. If these deductions are sound, one has an explanation for some of the apparent exceptions to the classical picture. If, in addition, it be accepted that the presence of other minerals in the silicotic lung tends to promote healing of a tuberculous infection after it has progressed for a period, one finds explanation for many of the cases of massive fibrosis seen in silicotic subjects which offer such problems in diagnosis.

The anatomical forms of tuberculosis encountered in silicotic lungs can be comprehended in four categories:

1. The primary complex, including tubercles in the pulmonary parenchyma and the tracheobronchial lymph nodes.

2. Typical reinfection tuberculosis, usually located in the upper third of the lung.

3. Tuberculosilicosis, a very chronic form which constitutes the commonest manifestation of the infection.

4. Acute perinodular tuberculosis, a rare form.

So-called *primary tuberculous infection,* if acquired during childhood probably has little significance in silicotic individuals. At least it is most uncommon to observe the pulmonary portion of the complex reactivate and spread locally under the influence of inhaled silica. The obvious reason is the fact that so few of these foci contain living tubercle bacilli at the age of industrial employment. The lymph node infections, on the other hand, may persist longer and it is conceivable that accumulating silica might reactivate a latent focus with resultant ulceration into a bronchus and dissemination into the lung. Recently a case suspected of such pathogenesis was sent to the Saranac Laboratory and it is possible that others in which massive conglomerate reactions spread like fans from the hilum may be of the same origin. If a first infection is acquired later in life, after the silicosis has already developed, one would expect an acute reaction similar to that observed in animals. Such cases will be considered under the fourth category of acute perinodular tuberculosis.

Reinfection tuberculosis of typical character, located in one or both pulmonary apices, occasionally appears in persons with slight amounts of silicosis or possibly in men whose dust reaction is old and no longer active. Under such circumstances the infection behaves typically and presents the usual clinical symptoms. It spreads locally within the lungs by way of the bronchi and gives rise to laryngeal and intestinal complications.

Tuberculosilicosis is much the most common manifestation of tuberculosis in silicotic subjects. It is characterized by one or more localized areas of massive fibrosis, situated usually in the upper lung although they may occur anywhere and are often bilateral. In typical cases there is a background of generalized silicotic nodulation but not infrequently in roentgenograms the nodular shadows may be absent or hard to discern because of contraction of the lung and superimposed emphysema. Such reactions are extremely chronic and serial films may reveal little change for several years. Usually there is some increase in the size of the area but bronchogenic spreads

into other parts of the lung do not occur. Laryngeal and intestinal complications are rare. The massive lesions cast too dense a shadow with ordinary exposures to permit visualization of their structure but in over-exposed films it may be possible to detect cavities in the late stages of the disease.

Anatomically the lesion of tuberculosilicosis is characterized by several unique features not seen in any other manifestation of tuberculosis. The involved area is rather sharply defined although string-like extensions may radiate into the surrounding tissue. It is stony-hard, usually black, grey or brownish in color. Careful inspection generally reveals nodular collections of scar tissue embedded in a matrix of similar appearance. In the active cases the tuberculous elements are manifested as foci of yellowish caseation or perhaps cavity formation with yellowish necrotic walls. When the infection is inactive it may be impossible to detect on gross inspection. With the microscope small tubercles are generally discovered if enough tissue is examined. However, a negative result reported from examining a few ordinary sections is of little significance. The traces of specific tuberculous reaction may be so widely scattered in the dense mass of fibrosis that only after examining several large sections, 3 or 4 inches in diameter, will the true nature of the process be apparent. A prominent feature of the microscopic picture is the obliterative endarteritis that involves most of the included arteries. The poor blood supply resulting from this condition frequently produces foci of anemic necrosis which may be several centimeters in diameter. These cavities can usually be distinguished from tuberculous ones by the absence of any definite wall or differentiating change in color. The tissue simply softens, leaving a slit-like opening filled with inky fluid, and bordered by a granular zone. Microscopically there is no evidence of leukocytic reactions. The bronchioles within such areas are compressed, distorted and show varying degrees of inflammatory reaction. Other portions of the lungs are almost invariably emphysematous and chronic adhesive pleurisy complicates all tuberculosilicotic foci that extend to the surface of the lungs.

As already indicated, this form of the disease is extremely chronic. Figures from South Africa indicate that, in the absence of a positive sputum, 53 per cent of its victims were still alive twelve years after its first appearance in a film and only 23 per cent had died within three years. The sputum tends to remain negative until late in the disease or at most only occasional organisms are found on repeated examination by culture or guinea pig inoculation. This, of course, can be explained by the infrequency of ulceration into the bronchi. The avascularity of tuberculosilicotic foci minimizes absorption and hence symptoms of intoxication are few. The same may explain why some of these cases fail to respond to ordinary doses of tuberculin. Dyspnea is the cardinal symptom and this is usually due to the associated emphysema.

The conglomerate focus of massive fibrosis in the silicotic subjects presents a problem in differential diagnosis both to the clinician and the pathologist. It is generally assumed that most large conglomerations are indicative of infection and the infection is most probably of tuberculous origin. Some of the smaller foci may be due to fusion of several discrete nodules but in my opinion there is a basis of infection in most of them. The infection may have healed leaving only sterile scar tissue to mark its site but this abnormality is sufficient to produce conglomeration. Infections other than tuberculous are capable of causing such reactions but their frequency is not known.

In pathological material, I have found definite evidence of tuberculosis in 60 per cent of the conglomerate lesions and in 60 per cent of these the infection was active and obvious; in the rest it usually required prolonged search to discover an occasional tubercle in the mass of silicotic fibrosis. In the remaining 40 per cent of the conglomerate foci no trace of tubercle was discovered. Whether this was because some other cause was responsible for the conglomeration or because enough tissue was not examined to find a small residual focus of tuberculosis is uncertain.

Acute perinodular tuberculosis is a rare form of tuberculosis apparently due, as indicated above, to implantation of a first infection upon a lung already silicotic. In my own experience it has occurred only in comparatively young persons. Earlier films on them have revealed the uniformly distributed shadows of generalized nodulation with their characteristic sharpness of definition. Then a routine reëxamination may disclose a change. The nodular shadows are no longer clean cut but have ill-defined fuzzy bor-

ders and somewhere in the lung field there is an equally ill-defined localized shadow.

The subject manifests symptoms of acute infection which increase in severity. Roentgenograms now show a tendency to consolidation. Tubercle bacilli appear in the sputum. In one case the lung ruptured with resultant empyema. Death occurs within a period of months and autopsy discloses an acute tuberculous pneumonia. Animals with fully developed silicosis in an active stage that are given a first infection also die of an acute tuberculous pneumonia and the process begins with the formation of tuberculous exudate about each silicotic nodule. In the human cases the early roentgenograms with their perinodular zones of haziness suggest that a similar mechanism is operative.

As has been indicated the one difficult problem of diagnosis is the case with a chronic, conglomerate lesion and dyspnea but no symptoms suggestive of infection. Experience has amply demonstrated that many of these patients will ultimately break down and die of tuberculosis but that there are some whose fibrous scars no longer contain living tubercle bacilli. Without the help of clinical symptoms the two types are hard to differentiate. At the present time one must assume that all of them are potentially active, keep them under careful observation with reëxaminations at least annually and be guided by the outcome. A lesion which changes appreciably within a year is most suspicious. It is doubtful whether the advanced case will be benefited by sanatorium care; the time for effective treatment is at the moment when conglomeration first occurs. Most of these men are short of breath but many may do well at light work. Prevention and not treatment should be our objective in tuberculosilicosis.

FISTULAS BETWEEN THE URINARY TRACT AND VAGINA*

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SINCE the beginning of medical history one of the important problems confronting the physician has been the care of the patient with a fistulous communication between the urinary tract and the vagina. Rawls[15] in 1931 made a comprehensive review of this subject. He indicated that surgical cures had been effected by various men prior to the time of Sims[17] in 1852. However, the well-conceived principles and the execution of them by Sims paved the way for the success which the surgeon now has in caring for this condition. Before 1900 further notable advances were made by Trendelenburg, Sanger and Fritsch,[18] who introduced flap-splitting, and by Mackenrodt,[18] who advocated free mobilization of the bladder and separate suturing of each layer of the vagina. Trendelenburg[8] was the first to utilize the suprapubic extraperitoneal or intravesical route and von Dittel[8] first made an approach transperitoneally.

Gynecologists of repute have contributed to the development of the surgical treatment of this condition but the good results now obtained in large measure are due to the work of the men just mentioned. A partial review of the more recent literature does not reveal any striking innovations in the treatment of vesicovaginal fistulas but does indicate that each surgeon is still applying basic principles with refinements of his own or of his contemporaries.[1,2,4,5,9,10,13,14,16,20,21] The mechanical ability of the surgeon in sizing up the situation in each case and utilizing the tissues to best advantage is most important.

Mayo[12] reported his method of treatment of small vesicovaginal fistulas in 1916. Since that time, Judd,[7] Masson,[6,11,19] Counseller[3] and others have added their reports of work done at the Mayo Clinic on this particular problem. Judd and Counseller, in their respective reports, reported on a total of 263 cases, in 259 of which surgical repair was employed. To this number we wish to add forty-eight cases of fistulas between the urinary tract and vagina in which surgical repair was undertaken at the clinic and thirteen cases in which operation was not per-

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formed. These cases were encountered at the clinic from January, 1937, to December, 1939, inclusive. The statistics obtained from a review of the histories in the forty-eight cases in which surgical treatment was employed at the clinic are given in Tables I to IV.

TABLE I. ETIOLOGIC FACTORS IN FORTY-EIGHT CASES OF FISTULA

	Cases	Per Cent
Operative procedures	33	68.7
Abdominal hysterectomy	23	
Vaginal hysterectomy	3	
Chemical hysterectomy	1	
Other operative procedures	6	
Obstetrical procedures	13	27.1
Radium treatment	1	
Congenital fistula	1	

From these statistics it is possible to derive a number of pertinent facts. In almost 69 per cent of these forty-eight cases fistulas developed after surgical procedures and in 27 per cent after childbirth (Table I). This represents a decrease of 12 per cent in the number of cases resulting from obstetrical procedures since Judd's report in 1916. This finding probably is due to the fact that obstetricians have recognized more fully the danger of prolonged labor and have been more accurate in their estimation of the pelvic capacity of their patients. As has been pointed out many times, operative obstetrical manipulations do not cause fistulas but the trauma and devitalization of vaginal and vesical tissues, incident to prolonged and difficult labor, are the real causes in most cases. In our series of forty-eight cases in which surgical repair was undertaken, four fistulas developed following surgical procedures performed at the clinic; forty-four developed following operations, obstetrical procedures and other causes before the patient came to the clinic. There was no instance of fistula in the obstetrical service at the clinic. Injury to the bladder or ureter is an occasional occurrence in difficult pelvic operations. If this is recognized at the time of operation, it usually can be easily repaired. If a fistula develops at a later date, it usually means that the injury was not recognized.

Most injuries to the ureter occur at a point low in the pelvis. When this occurs the injured ureter should be transplanted into the bladder wherever possible. Occasionally in a difficult case when the infundibulopelvic ligament is being tied or when a large adherent tumor is being mobilized, a ureter is injured higher in the pelvis. In such cases transplantation into the bladder is not feasible. Two courses are open to the surgeon, however. If the kidney on the opposite side is in good condition the injured ureter may be ligated. If this is not deemed advisable, the ureter can be transplanted to the skin and later it can be transplanted into the sigmoid or nephrectomy can be performed. Occasionally an injured ureter can be repaired, but the advisability of repairing an injury to the ureter is debatable as often ureteral stricture and subsequent pyelonephritis develop.

TABLE II. TYPE OF FISTULA

Fistula	Cases
Vesicovaginal	40
Urethrovaginal	2
Ureterovaginal	2
Uterovesical	4

The various types of fistula which were encountered in this group of cases are listed in Table II. Most of them were communications between the vagina and bladder but other types occurred with enough frequency to make an accurate pre-operative diagnosis extremely important.

That the condition may be difficult to cure is evidenced by the fact that twenty-nine of these patients had ninety operations or more than three per patient before they were seen at the clinic (Table III). Only nineteen, or less than 40 per cent, had had no previous operations. At the clinic thirty-eight (79.2 per cent) of the forty-eight patients had one operation and seven (14.7 per cent) had two. Three patients had more than two operations.

Vaginal closure was employed in 85.48 per cent of the cases. Other procedures were necessary in seven. These consisted of transplantation of the ureters into the sigmoid in two, abdominal closure in three, and nephrectomy in

TABLE III. NUMBER OF OPERATIONS FOR REPAIR IN FORTY-EIGHT CASES OF FISTULA

Operations	Cases	Per Cent
Before admission to clinic		
None	19	39.6
1	9	18.8
2	7	
3	2	
4	3	
5	2	
6	5	
9	1	
Total	90*	
At clinic		
1	38	79.2
2	7	14.6
3	1	
4	1	
6	1	
Total	65*	

*Operations.

two. The last procedure was done because of severe pyelonephritis with poorly functioning kidney on the involved side.

Of the forty-eight patients, forty-two or 87.5 per cent were cured by the operative procedures employed (Table IV). Some member of the surgical staff had kept in touch with all but three of the forty-eight patients for at least six months after operation. Data as to the rate of cure were deduced from this correspondence. These compare to previous reports from the clinic as follows: Judd obtained follow-up information in fifty-six of the seventy-eight cases which formed the bases of his report. Of his fifty-six patients, forty-six reported a complete cure. Four reported no benefit and six partial benefit. Thus 82.2 per cent of the patients who answered his inquiry were cured. Counseller stated that follow-up reports were incomplete in twenty-six of his 181 cases. One hundred and one patients reported that they were entirely cured and forty-eight complained of vesical difficulties; that is, of burning, frequency and pain. Leakage of urine persisted to some extent in a few cases. From this statement it is impossible to give the percentage of cures effected, although it is obviously high.

TABLE IV. TYPE OF OPERATION AND RESULTS IN FORTY-EIGHT CASES OF FISTULA

Operations and results	Cases	Per Cent
Vaginal closure	41	85.4
Abdominal closure	3	
Transplantation of ureter	2	
Nephrectomy	2	
Results		
Success	42	87.5
Failure	6	12.5

There were no operative deaths in the series reported by Judd. In the series of Counseller there were six deaths, three followed transplantation of the ureters because of a malignancy of the uterine cervix. Pyelonephritis, pulmonary embolism and pneumonia were the chief causes of death. In our series, that is, in forty-eight cases, there was one death which followed an attempt at abdominal closure. In this case intestinal obstruction which required enterostomy occurred, bronchopneumonia developed and death ensued.

In the three years covered in this report thirteen cases of fistulous communication between the urinary tract and the vagina were encountered in which operation was not performed because of the pathologic changes or because of personal reasons. Fistulas had developed in seven of these thirteen cases as a complication of carcinoma of the cervix; in three treatment with radium had been given. The etiologic factor in the other six cases was delivery in three, hysterectomy in two and incision of an abscess in one.

From 1933 to 1939 inclusive, one of us (Masson) has operated on thirty-four patients having vesicovaginal fistulas. In only one case was it impossible to effect cure. This is a rate of cure of 97 per cent. In the case in which failure occurred a large fistula was present and transplantation of the ureters into the sigmoid was recommended. The patient refused this operation but requested that an attempt be made from below. This was attempted with resultant failure.

In a recent letter this patient, however, stated that she is definitely better and by wearing a

tampon, which she makes herself out of a third of a sanitary pad, she has no trouble retaining urine for a considerable time and it is only when she is going out for any length of time that she has to wear a pad. She is very happy and thinks



Fig. 1. Long-handled instruments, fine needles and fine catgut are important aids.

that it is not necessary to have anything further done.

Operative Procedures

During the past few years the following procedure has been employed in repairing vesicovaginal fistulas of the majority of patients. General examination is made to certify the patient's ability to withstand a surgical procedure. Cystoscopic examination is conducted in order to determine the location and size of the fistula and its relationship to the ureters. At this time a silk thread which runs through the urethra, bladder, fistula and vagina is tied in place. If local treatment is necessary to clear the vagina and bladder of incrustations and infection, this is done before operation is attempted. Preoperatively the gastro-intestinal tract is emptied by purgation and enemas.

The patient is placed in the prone position with the buttocks elevated by a kidney rest (Kraske position). The vagina is thoroughly prepared with several coats of tincture of merthiolate. Instruments used which facilitate the operation are illustrated in Figure 1. An ordinary Fritsch abdominal retractor is inserted into the vagina and strong upward traction on the perineum serves to give adequate exposure of the anterior vaginal wall up to the vault of the vagina. With this position and type of retraction it has been possible to expose fistulas well up in the vault of the vagina without resorting to the Schuchardt incision. Downward traction on the cervix or uninvolved portion of the vaginal vault by a properly placed tenaculum also serves to facilitate exposure in difficult cases.

The silk thread, which was inserted preoperatively, is replaced by a silver or alloy wire. With this wire as a guide the fistula is dissected out, leaving a small amount of vaginal mucosa around the fistulous opening, and the bladder is mobilized as much as is necessary. The type of vaginal incision depends on the location and size of the fistula. In large fistulas the use of the wire is obviously unnecessary. The bladder opening is then closed by the use of interrupted sutures with No. 000 chromic catgut down to but not through the mucosa of the bladder. If the fistula is very small, a purse-string type of suture may be used; however, this type of suture is used only occasionally. The edges of the fistula are usually inverted into the bladder. This is easily accomplished if, after placing but before tying the first line of sutures, a moderately blunt nosed curved hemostat is clamped to the vaginal end of the wire guide and traction made on the end which comes from the urethra. As the end of the hemostat causes pressure on the fistulous opening, the sutures are tied and as the hemostat and wire are removed, inversion is accomplished. If possible, the first layer of sutures is reinforced by a second layer of catgut in the bladder. The vaginal layer is closed separately by placing several interrupted mattress sutures of fine black silk. This serves to pucker the vaginal layer over the site of closure in the bladder and to bring into apposition a larger portion of the vaginal layer. No attempt is made either to dissect out or suture separate layers in the vagina. Interrupted fine silk stitches are then placed in the edges of the vaginal incision. This procedure is carried out always bearing in mind the basic principles of adequate mobilization of the bladder and vaginal flap and of closure without tension. If these principles are neglected, failure is likely to result. When possible the line of the vaginal closure is made in a direction opposite to that of the vesical closure. The essential points of the operative procedure are illustrated in Figure 2.

The type of suture used in the repair of these fistulas has been a subject of considerable controversy. Our only experience with silver and

all other types of metal sutures has been to remove them. Undoubtedly certain surgeons find the use of metal sutures advisable but the use of catgut and silk has proved satisfactory at the clinic.

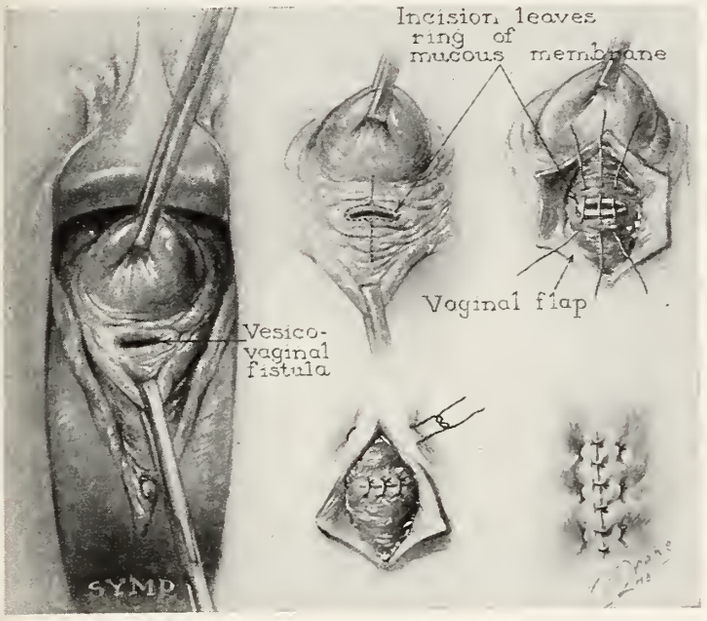


Fig. 2. The prone position and upward traction on the perineum with tenacula holding cervix and uninvolved portion of vaginal mucosa, give adequate exposure. Small rim of vaginal mucous membrane around fistula, adequate mobilization of bladder and vaginal mucous membrane, closure of bladder with interrupted catgut stitches and closure of vaginal layer in the opposite direction from the closure of the bladder are important steps in the operative procedure.

After a de Pezzer catheter is inserted through the urethra the patient is placed face downward on a bent Bradford frame which has been equipped with Albee pads. The Bradford frame is attached to a suitable support and the patient is thus kept elevated above the bed (Fig. 3). The prone position is maintained for a variable period of from seven to fourteen days. The head or foot of the frame can be raised or lowered as needed for the patient's comfort. The catheter, which drains into a basin placed on the bed, is irrigated with solution of boric acid every half hour day and night until the urine is clear; after that, irrigation is performed at increasingly longer intervals. The patient's position and the frequent irrigations insure the absence of pressure on the site of repair. Twice daily the operative site is carefully but fully exposed with a Deaver retractor and the vagina is cleansed with merthiolate and thoroughly dried, as a collection of purulent secretion regularly forms in the vagina and can be most injurious. A nonresidue diet is maintained for at least a week in order to obviate any danger of fecal contamination.

Before the patient is removed from the prone position on the Bradford frame an examination is made in the operating room. A solution of



Fig. 3. Patient in prone position on a Bradford frame supported in such a manner that head or foot can be lowered as desired insures continuous drainage of bladder.

methylene blue is instilled into the bladder under moderate pressure and the efficacy of the repair is noted. If no leakage is noted, the catheter is removed and the patient is allowed to resume activities as she is able. Catheterizations should be utilized judiciously to prevent the bladder from becoming distended. If leakage occurs at the time the methylene blue solution is instilled, it is wise to continue the use of the retention catheter and prone position for some time as often complete closure will ensue.

In order to illustrate the difficulty which may arise in rehabilitating the patient with a vesicovaginal fistula the following case is reported.

Report of Case

The patient, a married woman, registered at the clinic on September 18, 1939. She had had a uterine tumor removed in 1918 and radium treatment both before and after operation. In June, 1933, cystoscopic examination was done and a small growth was removed from the bladder and the base of the growth was cauterized. A few weeks after this the patient stated that she began to pass all of her urine via the vagina. She was hospitalized for two weeks but the fistula failed to close. Operative attempts to close the fistula were made elsewhere in November, 1933, November, 1936, and in February, 1937. Following the last operation, which had consisted of suturing the anterior and

posterior vaginal walls together, a rectovaginal fistula developed. In November, 1938, repair of the rectovaginal fistula was attempted. The result of this operation was fair, as she passed most of the bowel contents in the natural manner.

At the time of admission to the clinic the patient was having considerable pain and periodic episodes of profuse bleeding from the vaginal mucous membrane. This latter was so severe that marked secondary anemia had developed and her general condition was such that immediate hospitalization was deemed necessary.

On September 21, 1939, an examination under penthothal sodium anesthesia revealed a large vesicovaginal fistula which would easily admit the index finger, and a small rectovaginal fistula. There was no urethra. The vaginal mucosa was so macerated from the long continued irritation that the possibility of malignant change was considered. Biopsy, however, failed to reveal any malignant change. Profuse bleeding occurred at the time of this examination which served to emphasize the poor condition of the vaginal mucosa. A period of three weeks was utilized to improve the condition of the vaginal mucosa and the general condition of the patient.

Because of the poor condition of the vaginal tissues it was thought inadvisable to repair the rectovaginal fistula first as is usually done when this condition complicates a vesicovaginal fistula. Consequently, on October 14, 1939, both ureters were transplanted into the sigmoid. Three weeks later plastic repair of the rectovaginal fistula was done and at the same time the bladder was excised through the vagina. Convalescence from the cystectomy was satisfactory but the repair of the rectovaginal fistula was not successful. Therefore, three weeks after the second operation another repair of the rectovaginal fistula was undertaken. This proved to be successful. The patient was in the hospital a little more than three months. Six months after dismissal from our care she was in good condition and found it necessary to empty the rectum about every two and a half hours.

Summary and Conclusions

Data on sixty-one patients with fistula between the urinary tract and vagina have been analyzed and the results obtained from surgical treatment reported. Pre-operative treatment to improve the condition of the vaginal mucosa and the condition of the bladder is important in the ultimate result.

In the operative technic usually employed at the clinic emphasis is placed on the following points: (1) Kraske position with the buttocks elevated during the operation; (2) adequate exposure; (3) adequate mobilization of the vaginal flap and of the bladder with closure with interrupted sutures without tension. The vesical and vaginal openings are closed separately and in opposite directions.

Postoperative care to insure continuous drainage of the bladder is accomplished by placing the patient in the prone position on a Bradford frame.

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MINNESOTA SEROLOGICAL EVALUATION STUDY

A Committee Report

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IN view of the important place occupied today by the serological tests for syphilis, too much emphasis cannot be placed upon: (1) maintenance by the laboratory of the highest possible degree of accuracy in their performance; (2) constant alertness on the part of the clinician in respect to their proper interpretation. The increased trend toward the routine use of the serological tests for syphilis as a part of every physical examination, including the premarital examination already compulsory in nineteen states,[7] multiplies greatly the responsibilities resting upon laboratory and clinician alike.

Evaluation of the serodiagnostic tests for syphilis has been marked essentially by three stages of development:

1. An attempt to evaluate many different methods as performed by the authors or originators themselves, under ideal circumstances. Three of the earliest conferences held for this purpose were conducted under the auspices of the League of Nations Health Organization in 1923,[8] 1928[9] and 1930.[10] The first American conference followed in 1935.[1,2,3]

2. The evaluation of performance in state laboratories comparing results obtained under varying conditions in many different laboratories with those of the author-serologists serving as controls. The first of such studies was made in 1936,[11,12] thirty state, municipal, and private laboratories participating. Out of this has come the annual comparison under auspices of the United States Public Health Service as serodiagnostic tests for syphilis performed by all state laboratories.

3. Evaluation of local, municipal, hospital, and private laboratories within each state by comparison of results with those obtained in the state laboratory. Before undertaking such studies the latter must have attained a satisfactory level of efficiency as determined by the United States Public Health Service evaluation.[5,11,12,13]

Perhaps the greatest value of the League of Nations studies was that they set a precedent and probably stimulated the more significant American studies that have taken place since 1934. Though Eagle[4] and others have pointed out the deficiencies in the League studies as well as the first American study, they served their purpose well. Giving important guidance to all of the American studies is the Committee on Evaluation,[13] formed as a result of a coöperative arrangement between the United States Public Health Service and the American Society of Clinical Pathologists. Thirteen serologists, using thirteen procedures or methods, participated in the first American study, including all those now in relatively common use in Minnesota, i.e., Kolmer, Kline, Kahn, Hinton, Eagle, and Rytz (Lufkin-Rytz). The sensitivity and specificity ratings attained by the above author-serologists were:

Eagle	84.1	98
Hinton	86.6	99.3
Kahn	80.5	100
Kline	76.3	100
Kolmer	75.9	100
Lufkin-Rytz	84.7	98.7

In the second study (1936)[11,12] thirty laboratories (eleven state, five municipal, fourteen private) participated. Fifty-one performances of nineteen separate diagnostic tests were evaluated. Whereas many of the laboratories attained results comparing favorably with the originators of the method, a substantial number were obviously inefficient. In the third study (1937)[13] thirty-nine laboratories participated, entering a total of seventy-four test performances. Only eight laboratories performed a single test, the remainder two or more. The conclusions of the committee were similar to those expressed after the 1936 study, i.e., that many of the state laboratories maintained a high level of efficiency, but far too many were not qualified to perform efficient serodiagnostic service. Recommendations for improvement included strict adherence to technic of orig-

*Members of the committee include Lucy Heathman, Ph.D., M.D. (ex-officio), N. H. Lufkin, M.D., Francis W. Lynch, M.D., Paul A. O'Leary, M.D., Arthur H. Sanford, M. D., and R. R. Sulivan, M.D. (ex-officio).

Assisting the committee in this survey were M. W. Higginbothom, Ph.D., Evaluation Serologist, Minnesota Department of Health, Division of Preventable Diseases, and Marian Wilder, Ph.D., Statistician, Minnesota Department of Health, Division of Preventable Diseases.

inators (many modifications were being used) and provision of adequate training facilities for state and local laboratory technicians.

In 1938, forty-six laboratories representing forty-four states and the District of Columbia participated in the performance of ninety-six test procedures. The results of ten state laboratories approximated the control laboratories; five additional attained satisfactory results; thirty gave unsatisfactory results.

In 1939, thirty-eight state and three Public Health Service laboratories participated in the performance of ninety-seven test procedures (thirty-one complement-fixation, sixty-six flocculation). The ten laboratories approximating the control laboratories in 1938 did not participate; three laboratories approximated the results of the controls; thirteen additional attained satisfactory results; twenty-two state laboratories were unsatisfactory. The criteria for satisfactory performance throughout the recent evaluation studies have been those recommended at the Assembly of Laboratory Directors and Serologists, Hot Springs, Arkansas, October 21-22, 1938.[15]

1. Sensitivity rating (percentage of true positives from known syphilitic donors) not more than 10 points below the control laboratory.
2. Specificity (percentage of negative and doubtful from presumably non-syphilitic donors) must not be less than 99 per cent.

In 1940, for the first time, there was complete representation of all state and District of Columbia laboratories. The results have not yet been published. Judging from preliminary available material, it would appear that there has been a considerable improvement. An analysis of seventy-six standard test procedures (thirty-four Standard Kahn, sixteen Kline diagnostic, seven Eagle, nine regular Hinton, ten simplified Kolmer) reveals that all but sixteen were satisfactory from standpoint of specificity. However, there was a change made in computing the specificity and sensitivity rates in 1940 as compared with the preceding years. Instead of computing sensitivity on the basis of true positives in known syphilitics, credit was given for doubtfuls as:

$$\frac{\text{Positives} + \frac{1}{2}\text{ doubtfuls}}{\text{Known syphilitics}}.$$

This, of course, would raise the sensitivity rating of a number of tests. On the other hand, specificity was computed for the first time on the basis of

$$\frac{\text{Negatives} + \frac{1}{2}\text{ doubtfuls}}{\text{Normal donors}}.$$

Instead of getting full credit for a doubtful, in effect only half a point is given, thus tending to lower the specificity ratings in proportion to the number of doubtfuls encountered. Since many are greatly concerned about the false doubtful as well as the false positive reaction, this change in basis of computation may prove very desirable. The change should be kept in mind, however, in making comparisons between 1940 performance and that of previous years.

Intrastate Evaluation Studies

Although these studies have been in progress in many, if not all, of the states eligible to conduct them, only a relatively few statewide studies have as yet appeared in the recent literature.[14,16] Webb, Sellers and Burney[16] reporting upon the 1939 evaluation study in Georgia observed:

1. Twenty-one of the forty laboratories in the state performing serologic tests for syphilis, agreed to participate in the study on a voluntary basis. The participating laboratories performed 92 per cent of the serologic work in the state exclusive of the State Health Department.
2. Twenty-two laboratories employed Kahn standard, seven a modified Wassermann.
3. Results:
   a. *Kahn*—seven laboratories satisfactory both as sensitivity and specificity.
      Eight laboratories unsatisfactory as to sensitivity, satisfactory as to specificity.
      Two laboratories satisfactory as to sensitivity, unsatisfactory as to specificity.
      Three laboratories unsatisfactory as to sensitivity, unsatisfactory as to specificity.
   b. *Wassermann*—Two satisfactory as to sensivity and specificity.
      Five unsatisfactory as to sensitivity, satisfactory as to specificity.

Minnesota Study

Although eligible to conduct intrastate studies prior to 1939, lack of sufficient funds delayed their organization until that time. At the May, 1939, meeting of the Minnesota State Medical Association, the recommendations of the Hot Springs Assembly of Laboratory Directors and Serologists relative to intrastate evaluation stud-

ies were placed before the councilors and representatives by its syphilis committee. A resolution was passed in favor of a comparative study on a voluntary basis.

Beginning in June, a survey of all laboratories in Minnesota was made to determine how many were performing serodiagnostic tests for syphilis, the types of tests used, and the approximate volume of work done. From this survey it was learned:

1. There were approximately twenty-eight laboratories (municipal, hospital and private), exclusive of the State Department of Health, performing one or more types of serologic tests for syphilis.

2. This included at least ten small hospitals employing a test in the selection of donors, a check specimen being submitted to the State Department of Health laboratories in each case.

3. There were thirteen complement fixation and thirty-four flocculation performances conducted in the twenty-eight laboratories.

On September 29, a meeting of clinical pathologists, with representatives of the University of Minnesota, Syphilis Committee of State Medical Association, and State Department of Health was held to consider the matter. A resolution favoring the study was passed. Following the example set in the national evaluations, a State Serologic Committee was appointed by the State Board of Health at its November meeting. The first meeting of the committee was held December 1 and plans outlined.

Details cannot be given here, but the main points agreed upon were as follows:

1. All laboratories performing serologic tests for syphilis, regardless of size, should be invited to participate at the same time.

2. All tests performed routinely by each laboratory were to be included. Details of technic in respect to every test should be submitted by each participant.

3. One hundred syphilitic donors and 100 non-syphilitic, presumably well, donors were to be used as a basis for the study.

4. The syphilitic donors were to be carefully selected by syphilologists from the syphilis clinics at University Hospital, Minneapolis General, Ancker, and Mayo Clinic, each if possible to contribute twenty-five cases. Evidence supporting the diagnosis should be incontrovertible. Not more than 10 per cent of the cases were to be early, the majority latent and late types treated and untreated, thus assuring a large number with low reagin titer.

5. Non-syphilitic donors would be selected from among University medical students, interns, etc.

6. Both syphilitic and non-syphilitic donors were to be paid at rate of $5.00 per 100 c.c. of blood.

7. No spinal fluids were to be included in the first study.

8. No donors with diseases other than syphilis were to be included in first study.

9. Time of study to cover approximately three months; ten specimens to be sent to each laboratory twice a week.

10. Whole blood to be used rather than serum. Details of collection and shipment to be worked out by State Department of Health. Shipment to be arranged so that specimens would arrive in all laboratories about the same time.

11. Tabulation of syphilitic donors giving age, sex, detailed diagnosis and amount of treatment to be submitted by the staff of each contributing clinic directly to the chairman of the committee at the conclusion of the study.

12. Results to be reported as positive, negative, doubtful on blanks provided for that purpose. However, those laboratories routinely reporting their results in terms of 1-4+ should be permitted to report in such a manner in the study, provided that the appropriate columns (positive or doubtful) were used. Reports were to be submitted to the chairman of the serologic committee.

13. Correlation and evaluation of results deferred for consideration after completion of study.

Conduct of Study

Nineteen of the twenty-eight laboratories elected to participate. It is estimated that more

than 90 per cent of the serological tests done in the state (exclusive of the State Department of Health laboratory) are performed by the laboratories that participated in the study:

TABLE I.

Laboratory	City	No. of Tests
Ancker Hospital	Saint Paul	2
Deaconess Hospital	Minneapolis	1
Fairview Hospital	Minneapolis	1
Mayo Clinic	Rochester	5
Medical Arts Lab.	Minneapolis	1
Miller Hospital	Saint Paul	2
Mpls. General Hospital	Minneapolis	4
Mpls. Health Dept.	Minneapolis	2
Minn. Dept. of Health	Minneapolis	9
St. Lukes Hospital	Duluth	3
St. Mary's Hospital	Duluth	1
St. Mary's Hospital	Detroit Lakes	1
St. Paul Health Dept.	Saint Paul	2
St. Vincent's Hospital	Crookston	1
Swedish Hospital	Minneapolis	3
Univ. Bacteriology Dept.	Minneapolis	2
Univ. Hospitals	Minneapolis	1
Wesley Hospital	Wadena	1
*X Laboratory	Minneapolis	2
Total		44

*Laboratory desired to participate under this identification for special reason.

The study began on January 29, 1940, and was completed on April 3. Forty-four test performances as conducted in nineteen different laboratories were included. Eleven were complement fixation and thirty-three flocculation tests:

Complement Fixation Test	*No. of Laboratories*
Qualitative Kolmer	3
Larson Wassermann	2
Craig Wassermann	2
Kolmer (modified)	1
Kolmer (modified)	1
Kolmer Routine	1
Johns Hopkins Wassermann	1
	11

Flocculation Test	*No. of Laboratories*
Kline Diagnostic	10
Kahn	8
Rytz I	4
Rytz II	1
Hinton	4
Kline Exclusion	1
Eagle	1
Mazzini	2
Meinicke	1
Lauglen	1
	33

Analysis of Syphilitic Donors

An analysis of the syphilitic donors (Table II) indicates that:

1. Approximately 89 per cent were of the late latent, late and congenital types, late latent and neurosyphilis predominating.
2. 85 per cent of the cases had received one year or more of treatment, though not necessarily regular.

Two of the cases, one from syphilitic and one from non-syphilitic group, were dropped from the study because of questionable diagnoses, thus leaving ninety-nine in each group.

TABLE II

Diagnosis	Sex	Length of Treatment in Years				
		Less than 1	1—1.9	2—2.9	More than 3	Total
Primary	M	—	—	—	—	—
	F	—	—	—	—	—
Secondary	M	1	—	1	—	2
	F	1	—	1	—	2
Early latent	M	1	1	—	—	2
	F	1	1	2	1	5
Late latent	M	4	10	3	3	20
	F	1	6	3	2	12
Cardiovascular	M	—	1	—	1	2
	F	1	1	1	—	3
Neurosyphilis	M	4	8	7	4	23
	F	—	5	5	4	14
Other late	M	1	3	1	—	5
	F	—	2	2	—	4
Congenital	M	1	1	—	—	2
	F	—	2	1	—	3
Total	M	12	24	12	8	56
	F	4	17	15	7	43
All		16	41	27	15	99

TABLE III. SPECIFICITY AND SENSITIVITY OF TESTS

Test	Test No.	Specificity Normal Individuals							Sensitivity Syphilitic Cases					
		Pos.	Doubt.	Neg.	Total Run	$\frac{N_1}{T_1}$	$\frac{N_1+\frac{1}{2}D_1}{T_1}$*	$\frac{N_1+D_1}{T_1}$†	Pos.	Doubt.	Neg.	Total Run	$\frac{P_2}{T_2}$	$\frac{P_2+\frac{1}{2}D_2}{T_2}$
Kolmer Qualitative	1	1		98	99	99	99	99	31		67	98	32	32
	2		1	98	99	99	99	100	62	13	19	94	66	73
	3			99	99	100	100	100	87	3	9	99	88	89
Other Complement Fixation	4			99	99	100	100	100	61	10	28	99	62	67
	5	1	3	95	99	96	97	99	61	13	25	99	62	68
	6			99	99	100	100	100	60	9	29	98	61	66
	7			99	99	100	100	100	70	5	24	99	71	73
	8			98	98	100	100	100	43		55	98	44	44
	9	1		97	98	99	99	99	26	5	68	99	26	29
	10			99	99	100	100	100	41	1	57	99	41	42
	11	2		96	98	98	98	98	46	7	46	99	46	50
Kline Diagnostic	12			99	99	100	100	100	85	1	13	99	86	86
	13			99	99	100	100	100	52	43	4	99	53	74
	14		1	98	99	99	99	100	60	34	5	99	61	78
	15			99	99	100	100	100	96	2	1	99	97	98
	16	3	5	91	99	92	94	97	93	4	2	99	94	96
	17	1	5	93	99	94	96	99	52	15	32	99	53	60
	18	18	11	68	97	70	76	81	81	7	10	98	83	86
	19	2		96	98	98	98	98	41		58	99	41	41
	20	7	1	90	98	92	92	93	63	6	30	99	64	67
	21	1	5	93	99	94	96	99	84	7	8	99	85	88
Kahn	22			99	99	100	100	100	65	25	9	99	66	78
	23		1	83	84	99	99	100	51	20	17	88	58	69
	24		1	98	99	99	99	100	85	9	4	98	87	91
	25			99	99	100	100	100	70	14	15	99	71	78
	26		3	96	99	97	98	100	89	3	6	98	91	92
	27	1	4	41	46	89	93	98	18	5	30	53	34	39
	28			99	99	100	100	100	71	4	24	99	72	74
	29	2		96	98	98	98	98	76	6	17	99	77	80
Rytz I	30	4	3	91	98	93	94	96	82	7	10	99	83	86
	31	10	3	86	99	87	88	90	85	2	11	98	87	88
	32	1	1	97	99	98	98	99	88	3	8	99	89	90
	33	10	1	88	99	89	89	90	92	4	3	99	93	95
Hinton	34			99	99	100	100	100	87	9	3	99	88	92
	35		1	98	99	99	99	100	69	29	1	99	70	84
	36			99	99	100	100	100	90	7	2	99	91	94
	37			93	93	100	100	100	78	11	6	95	82	88
Mazzini	38			99	99	100	100	100	94	4	1	99	95	97
	39			99	99	100	100	100	98	1		99	99	99
Rytz II	40	2		97	99	98	98	98	86	5	8	99	87	89
Kl. Excl.	41	3	2	94	99	95	96	97	99			99	100	100
Eagle	42		2	97	99	98	99	100	94	4	1	99	95	97
Meinicke	43			90	90	100	100	100	41		48	89	46	46
Laughlen	44	2		97	99	98	98	98	56	1	42	99	57	57
Total		72	54	4,138	4,264				3,059	358	856	4,273		

Key to Table III

N is number of negatives
P is number of positives
T is total number
1 is normal group
2 is syphilitic group

*Formula used in 1940 for computing specificity in National Evaluation.

†Formula used prior to 1940.

Results of Study

When the complete reports had been received from all laboratories, the committee decided that several methods of evaluating the results should be employed as follows:

In determining specificity:

1. $\frac{\text{Negatives} + \text{Doubtfuls}}{\text{Total Normal Donors}} \quad \frac{N_1 + D_1}{T_1}$
(Method employed in National evaluation prior to 1940)
2. $\frac{\text{Negatives} + \frac{1}{2}\text{ Doubtfuls}}{\text{Total Normal Donors}} \quad \frac{N_1 + \frac{1}{2}D_1}{T_1}$
(Method employed in National evaluation of 1940)
3. $\frac{\text{Negatives}}{\text{Total Normal Donors}} \quad \frac{N_1}{T_1}$
(Used experimentally to determine what effect could be if no credit at all was allowed for a doubtful)

In determining sensitivity:

1. $\frac{\text{True Positives}}{\text{Total Syphilitic Donors}} \quad \frac{(P_2)}{T_2}$
(Method employed in National evaluation prior to 1940)
2. $\frac{\text{True Positives} + \frac{1}{2}\text{ Doubtfuls}}{\text{Total Syphilitic Donors}} \quad \frac{P_2 + \frac{1}{2}D_2}{T_2}$
(Method employed in National evaluation in 1940)

Table III gives a complete tabulation of the results computed according to the above formulæ. It was decided to assign a number to each test procedure rather than to each laboratory since each laboratory was to be provided with a complete summary of the findings of all others participating, together with its own code numbers for identification.

Charts 1, 2, 3 and 4 provide the essential information in graphic form, employing the methods of evaluation adopted by the National Evaluation Committee for 1940. The findings were presented to the committee members in June, for study and recommendations.

Disposition of Results

At a meeting held September 16, 1940, the committee agreed upon the following:

1. Each laboratory should be supplied with a complete tabulation of results together with an individual case analysis of syphilitic donors showing diagnosis, amount of treatment, etc.

2. Approval of plan whereby the State Department of Health evaluation serologist would continue to visit the participating laboratories and render all possible assistance desired in improving their serologic performance. In addition the facilities of the State Department of Health laboratories may be made available to technicians in local laboratories desiring assistance in meeting special problems.

3. In place of the formal type of evaluation carried out in 1940, the 1941 plan, the details of which were to be worked out by the State Department of Health, should provide an opportunity for participating laboratories to systematically compare test performance throughout the year. A schedule providing for the comparison of results on ten specimens per week was believed suitable. Those laboratories having access to a syphilis clinic could arrange for the splitting of specimens by the staff of that clinic; others would have to have specimens sent to them. Results would be reported by each laboratory directly to the State Department of Health,

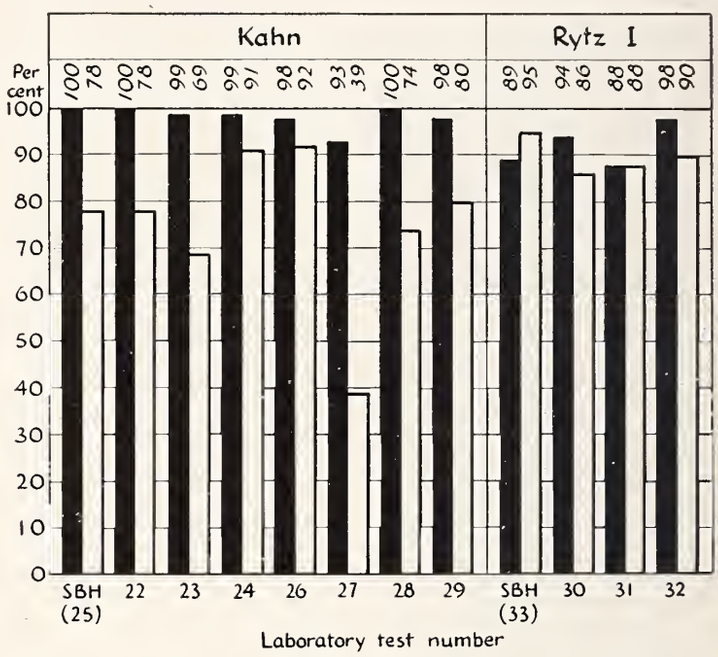


Chart 1. Black areas indicate specificity; white, sensitivity.

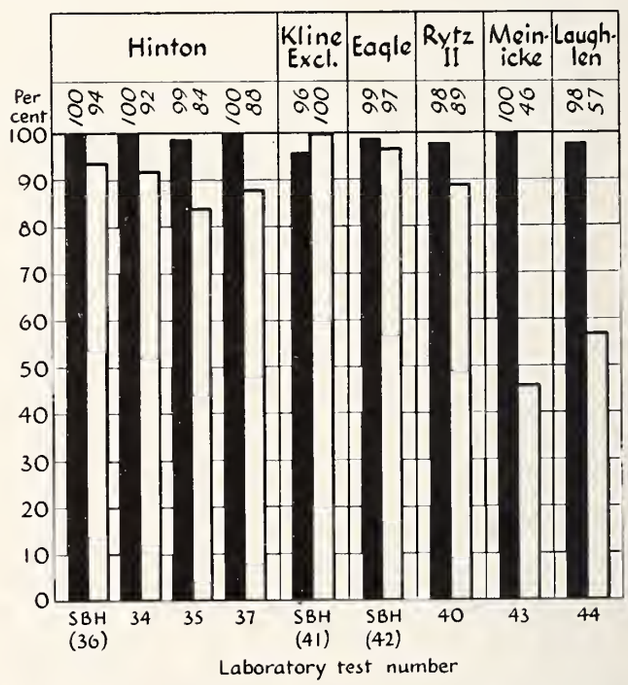


Chart 2. Black areas indicate specificity; white, sensitivity.

Division of Preventable Diseases. The results observed in the state laboratories would in turn be reported to the participating local laboratory.

4. The results of the 1940 evaluation should be published in MINNESOTA MEDICINE. One of

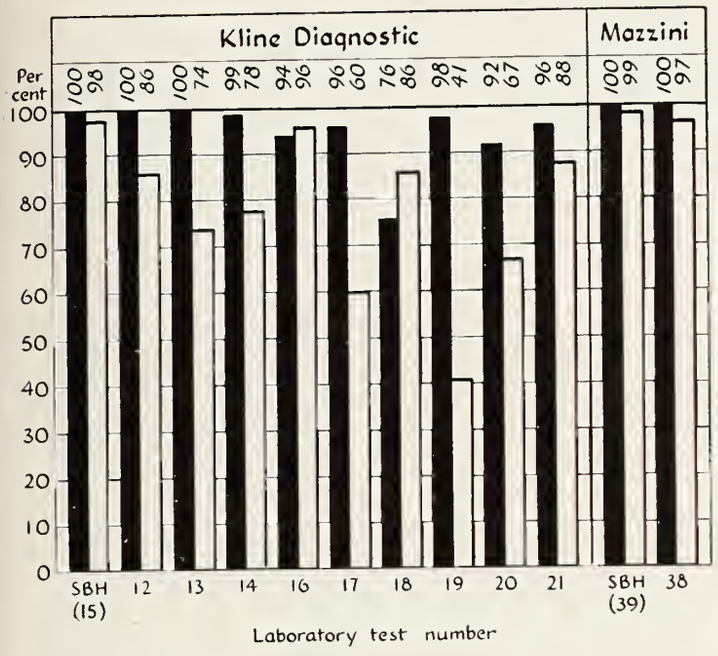


Chart 3. Black areas indicate specificity; white, sensitivity.

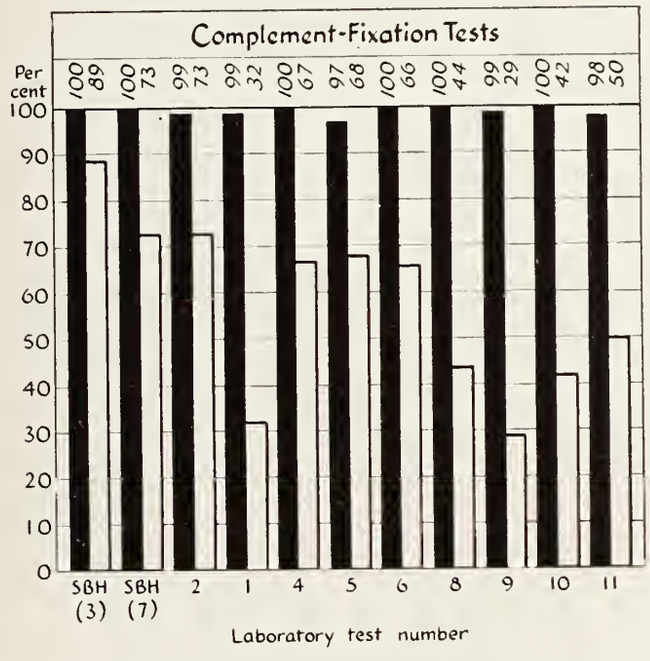


Chart 4. Black areas indicate specificity; white, sensitivity.

us (R.R.S.) was instructed by the committee chairman to prepare this report.

The 1941 Study

The plan advocated for 1941 has been in operation for several months. Thirty-two laboratories, including the State Department of Health, are participating. The schedule is so arranged that each laboratory cross checks with the State Department of Health Laboratory for one week of every month. During this week ten specimens are subjected to comparative examination. No pooled sera are employed under this system, all specimens being of whole blood from known syphilitics, known normals, or individuals available for further study in event of any question as to diagnosis. Although the informal year around plan would appear to have a number of obvious advantages, it cannot be evaluated as yet on the basis of the limited experience with it.

Summary

1. A brief review and analysis of the serological evaluation studies as conducted in the United States since 1934 has been presented.

2. The organization and conduct of the first evaluation study in Minnesota has been discussed.

3. The results of the study have been statistically analyzed, and presented in Table III and Charts 1, 2, 3, and 4 without special comment.

4. Since completion of the 1940 study, many of the participating laboratories have clearly indicated their interest in improving test performance.

5. It is believed that the continuation of such studies and the informal interlaboratory checking will be mutually beneficial to all laboratories participating in them.

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TREATMENT OF INTRACAPSULAR FRACTURES OF THE FEMUR WITH THE SMITH-PETERSEN NAIL*

Report of Twenty-two Consecutive Cases

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ONE of the most noteworthy advances in the field of surgery in the last decade has been the development of the method of treating intracapsular fractures of the neck of the femur by internal fixation after closed reduction. Fixation by metal plates, screws and other devices, has long been known, but until its adaptation to the femoral neck, little progress was made. The improvement in results was soon reflected in statistical reports. Thus, in 1,485 cases, a report of the Fracture Committee of the American Academy of Orthopedic Surgeons[1] shows that union took place in 89.4 per cent, a much higher percentage than has been obtained under any of the older methods. Furthermore the mortality rate was reduced to only 8.5 per cent.

There are two main factors in this treatment which facilitate union: (a) absolute fixation of the fractured ends; (b) unrestricted mobility of the extremity, permitting free circulation. Further advantages may be briefly summarized:

1. There is practically no shock following the operation, and the operation can be done with comparative safety where other types of treatment would be contra-indicated.

2. There is less pain and greater comfort to the patient. The initial pain which follows the operation soon subsides, and as no other immobilization is necessary, the patient is free to move and change position in bed without restraint. After the first few days he may sit up in a chair or be permitted on crutches.

3. The elimination of the prolonged period of immobilization with casts or appliances greatly lessens the likelihood of pulmonary complications, the chief cause of mortality with the older methods.

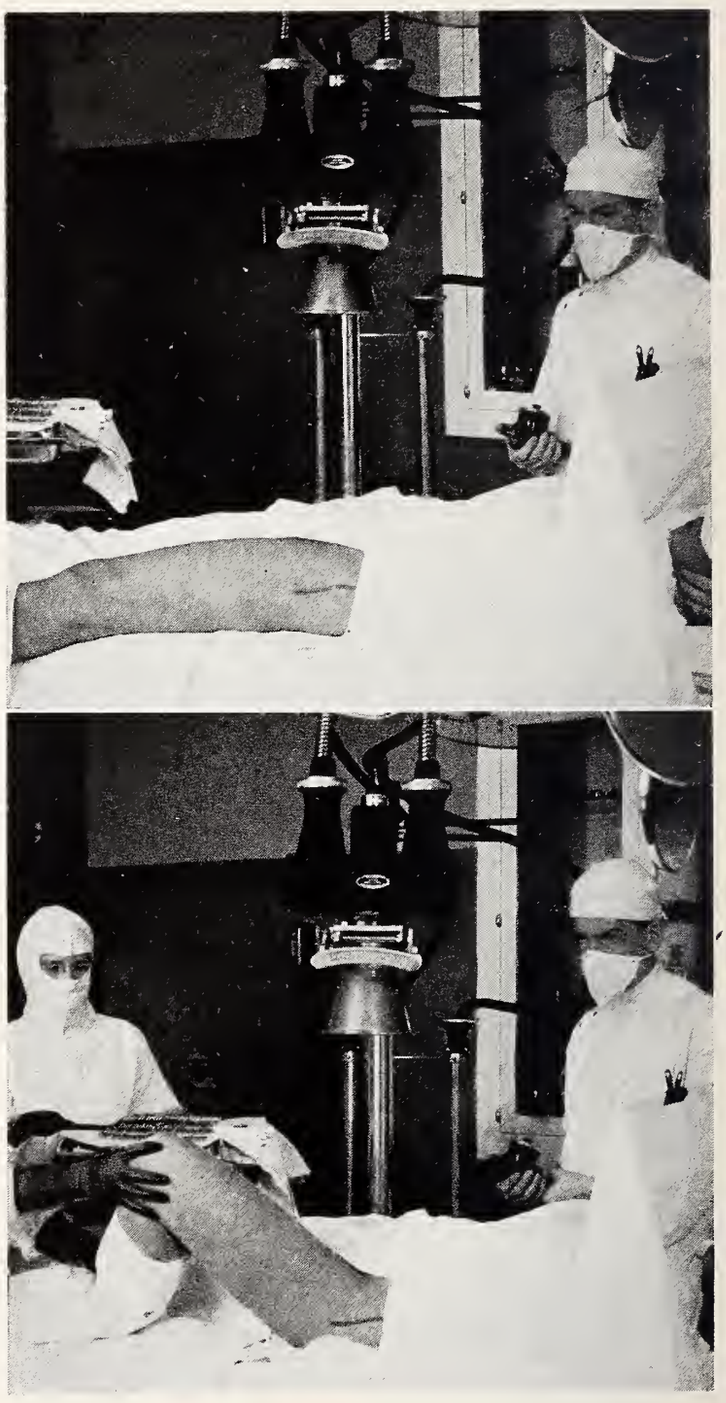


Fig. 1. (*above*) Operative set-up with portable unit in position for anterior-posterior view.

Fig. 2. (*below*) Method of taking lateral view without changing position of equipment.

*Read before the Saint Paul Surgical Society, Saint Paul, Minnesota, February 13, 1941.



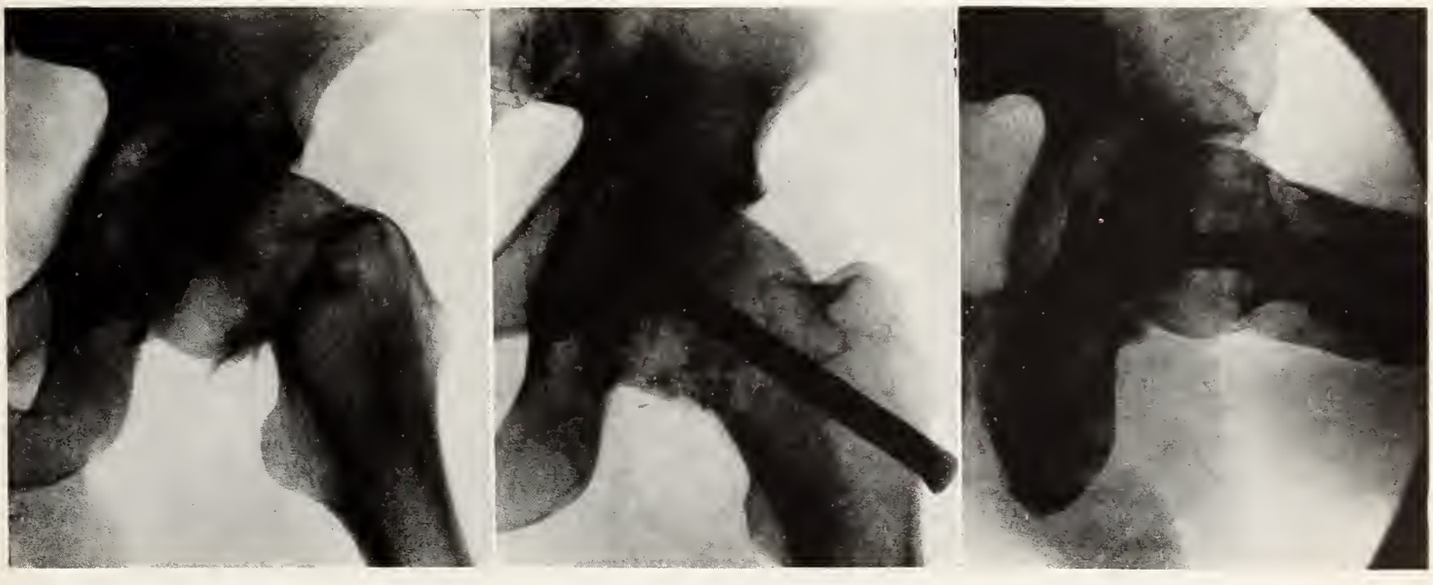
3a 3b 3c

Fig. 3. Subcapital fracture. *a*, Before treatment; *b*, antero-posterior film after fixation; *c*, lateral view.



4a 4b 4c

Fig. 4. Transcervical fracture. *a*, Before treatment; *b*, antero-posterior film after fixation; *c*, lateral view.



5a 5b 5c

Fig. 5. Transcervical fracture. *a*, Before treatment; *b*, antero-posterior film three months after fixation; *c*, lateral view.

4. Since almost normal functions of the extremity are possible, with the exception of weight bearing, muscular atrophy and ankylosis of the knee and ankle are avoided.

5. Pressure sores do not develop.

6. Nursing care is rendered less difficult and expense reduced to a minimum, inasmuch as after the incision is healed, the patient may convalesce at home instead of at the hospital.

There are few contra-indications, but as in other surgical conditions, these patients require a careful pre-operative physical examination and an appraisal of their general condition. Most of them are aged and infirm, some are in shock and others dehydrated and still others already have complications such as diabetis and cardiovascular disease. In such cases proper pre-operative preparation is essential.

Preparation of Patient.—Unless otherwise contra-indicated, spinal anesthesia is used. An ordinary operating table is used and before the patient is prepared, he is placed on the well side and the spinal anesthetic is administered. The reason for using an ordinary table is that it is better adapted to this type of operation since no traction is necessary. After the administration of the anesthetic, the patient is again placed on his back and the table is slightly tilted as required for the effect of the anesthesia. An arm board is attached to the lower end of the table for the support of the injured leg, since this is necessary in order to secure proper abduction. A portable x-ray is placed on the well side and a tunnel underneath the hips of the patient, which opens on the same side as the x-ray. It is important that all details be attended to before sterilizing and draping the patient since rigid asepsis is necessary, and once in place, no part of the set-up should be disturbed until after the close of the operation.

The site of the operation is prepared by sterilization with any one of the accepted solutions in use, such as merthiolate, metaphen, or iodine. The whole leg, including the foot, thigh and hip, is prepared. This is done to allow free manipulation in the reduction. While an assistant raises the extremity, sterile sheets are placed underneath and finally the foot and leg are passed through the opening of a lap sheet which is drawn well above the fracture. The fracture is now reduced by the following method: flexion, traction in flexion, abduction and internal rotation. After reduction has been accomplished, the position is maintained by an assistant throughout the operation. Roentgenograms are taken, both in the anterior-posterior and lateral positions. Both views are taken without moving any part of the equipment. The lateral view is obtained by gently flexing the thigh to almost a right angle with the body, at the same time maintaining abduction. If reduction is satisfactory, the operation is begun.

Instruments.—Besides the usual instruments required for an incision and suturing, the following are included: Bailey guide, driver handle, extractor; hammer and bone drill; two Steinman pins and an assortment of Smith-Petersen nails of varying lengths.

Technique.—An incision is made about 3 inches in length over the great trochanter parallel to the long axis of the leg. The muscles are retracted and the bone is exposed. The guide is inserted between the fibers of the vastus externus just below the attachment of this muscle. With the use of the drill, a pin is introduced about 2.5 or 3 inches through the center hole of the block. Pictures are then taken as before and if the position is satisfactory, the guide is removed and a nail of the proper length is threaded over the pin. After attachment the driver handle is introduced to the proper distance, and the guide pin is removed. Additional pictures are taken and if the position of the nail is satisfactory, the wound is closed and the operation completed. No cast or other retentive apparatus is applied.

Postoperative Care.—Postoperative care is as for other major surgical cases. A sandbag may be placed on the outer side of the leg and a cradle to support the bed clothing over the extremity. Active and passive motion in bed may be begun as soon as the primary reaction of the operation is over. Other treatment is as indicated depending upon the individual condition of the patient. Weight bearing should not be permitted until the clinical condition and x-ray pictures indicate union. Very little, if any, callus occurs and the extent of bony union can only be judged by the obliteration of the fracture line

and the appearance of bone trabeculation in the roentgenogram.

Results.—There are twenty-two consecutive cases reported in this series. The average age is 66.5 years, the youngest being forty-four and the oldest ninety. There were no infections and no operative deaths. The time of operation after the fracture varied from one day to six and a half, in most instances within the first week after the injury. Pulmonary emboli occurred in two patients with recovery in both instances. Phlebitis was present in two, mental confusion in one, and cardiac-decompensation in one. Non-union occurred in three patients on one of whom a reconstruction operation has been done. The other two will remain untreated on account of age and other infirmities.

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TREATMENT OF NEUROLOGIC CHANGES COMPLICATING PERNICIOUS ANEMIA*

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SINCE the salient aspects of the treatment of the neurologic changes that complicate pernicious anemia are generally known, we shall depart from the usual custom of an oblique introductory approach and come to the point at once. Thereafter, we should like to discuss some considerations of the subject that are commonplace but which are yet relevant and not unimportant.

All are agreed that if irreparable damage to the nervous system is to be avoided, treatment must be begun at the earliest possible moment. The number of physicians who insist that anything other than liver extract administered parenterally in adequate doses is of material importance, is decreasing steadily. We cannot offer, on the basis of our own material or experience, an analysis of the therapeutic results or of the relative merits of either the more or the less concentrated extracts. Sturgis and his colleagues preferred the less concentrated preparations, whereas Murphy and Howard preferred the concentrated preparations, even for the treatment of the neurologic disturbances. Whether the relative merits of the more or the less concentrated preparations have been investigated in parallel series of cases we do not know.

We have used two types of preparations. Of the less concentrated preparations, of which we have used one containing 1 unit of anti-anemic material per cubic centimeter, we administer 10 c.c., intramuscularly, in divided doses during the first three days and, thereafter, 3 c.c. every five to seven days. When we use the more concentrated preparations (containing 15 units per cubic centimeter), we inject 1 c.c. three times during the first week; thereafter, 1 c.c. every five to seven days. If in two months there has been no evidence of improvement we double the dose or shorten the interval of administration. Should infection occur or extra demands be thrown on the patient, the dose of liver extract should be doubled. If improvement occurs, we continue to inject liver extract until all neurologic manifestations have disappeared, after which the interval between injections may be gradually increased.

The maintenance of an erythrocyte count of 5,000,000 in each cubic centimeter of blood will serve, according to Murphy and Howard, to indicate that the nervous system is being protected adequately. Some authors concede that an erythrocyte count of 4,500,000 is a safe minimum, but in the final analysis, the nature of the neurologic picture must serve as the guide. The intensity of the neurologic symptoms is no criterion of the prognosis, but the duration of them is a criterion. Hyland and Farquharson, whose survey of subacute combined degeneration we can endorse warmly, found no improvement in the treatment of neurologic disturbances that had been present for more than four years. Ungley suggested that two years be accepted as the critical period, before the end of which much may

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be hoped for, and after which there occurs a steadily decreasing prospect of improvement. These observations are in keeping with neurologic experience.

An appraisal of the gross results of therapy was offered by Hyland and Farquharson. Of seventy-four cases, in forty-one, or 55 per cent, there was marked improvement, and in an additional sixteen, or 22 per cent, there was moderate improvement, which produces a total of 77 per cent. It may be proper to deduct from the seventy-four cases eight in which death occurred shortly after admission of the patients. If this were done, the proportion of cases in which improvement occurred would be increased to 86 per cent. With such deduction continued, in half the sixteen cases in which the neurologic complication was severe, there would result an improvement which could be classified as "marked." It is apparent from the table of Hyland and Farquharson that the most marked improvement was obtained in cases in which the condition was mild or moderately severe.

Their analysis disclosed that the greatest improvement took place from the third to the sixth month, and that the situation became relatively stationary by the second year.

In sixty-six cases they found that the symptoms and signs which responded best to treatment were paresthesia, impairment in joint sense and gait, impairment of superficial sensation and disturbance of sphincteric control. Psychic disturbance also usually improved. Least responsive to treatment were impairment of vibratory sensation, an extensor plantar response, and absence or diminution of the Achilles tendon reflexes.

Excellent functional recovery may occur even when the pathologic changes in the spinal cord are marked, as has been shown among patients who have died from intercurrent diseases. In the spinal cords of patients who have been treated with liver extract, the characteristic ballooning of the myelin sheaths is not seen and a well-developed fibrillar glial scar is present.

So far as we know, a study of the brains of patients suffering from pernicious anemia who have received adequate treatment with liver has not been made. It is often said that changes in the brain do not occur so commonly in the presence of pernicious anemia as do changes in the spinal cord. This is not so; what actually happens is that the Lichtheim foci are not discovered so easily and are not sought so often, adequate examination is time-consuming and costly and the results of secondary degeneration do not become so obvious in the brain as they do in the spinal cord.

A few writers have advocated complete rest in bed for the patient during the first three months of treatment. From the neurologic standpoint we can see little to be gained by this procedure. Just how much can be achieved by physical therapy, including infra-red radiation, contrast baths, sedative massage, and, especially, muscle-training exercises, it is difficult to appraise. Many patients improve without such therapy, but there are patients in whom the damage done to the spinal cord is beyond repair. When this occurs, physical therapy should be given a long and patient trial.

The bladder, too, may need attention. When catheterization becomes necessary, the administration of 5 to 7 grains (0.3 to 0.45 gm.), four times daily, of a sulfonamide preparation, such as sulfathiazole, may be of help, and the assistance of a urologist may add greatly to the patient's comfort and safety.

The infrequent appearance of retrobulbar neuritis may not be dismissed by saying simply that it is due to pernicious anemia. The records of five such patients, seen by us in the course of the five years prior to this report, are complicated and we shall not attempt to give any of them in detail. Two of five patients were more than seventy years of age. In four cases subacute combined degeneration of the spinal cord was present; in one this was only slight, and in one the patient had recovered from it before the central scotoma had appeared. Four patients used tobacco to excess; three of these four had hypertension, and two of these also had severe diabetes. In two cases there was some improvement in vision, but in none did it become normal. We should say, however, that the visual disturbances of all these patients had been present for six months or longer, and we do know that, whatever the cause of retrobulbar neuritis, it should be treated early. Although this is a small series of cases, it does seem likely that pernicious anemia, uncomplicated and by itself, seldom causes retrobulbar neuritis.

Trophic ulcers are rare and for this reason need not detain us long. Lasch described a case

of pernicious anemia in which symmetric, indolent ulcers were situated on the lateral aspects of the legs. On treatment of the patient with liver these healed promptly.

We should like now to deviate slightly from the subject and to discuss some considerations which are taken for granted and some which are controversial. Some writers whose observations demand respect are of the opinion that vitamin B_1 or components of the vitamin B complex are responsible for the healing of subacute combined degeneration. Ungley pointed out, however, that the liver preparation of Dakin and West contains no vitamin B_1, yet it is helpful in the treatment of the neurologic disabilities of pernicious anemia. A preparation of brewers' yeast was given a long and thorough trial, and was discarded. Since purified preparations of several components of the B complex are now available, it is probably safe to assume that the administration of these alone does not cure the characteristic lesion of the spinal cord caused by pernicious anemia; otherwise they would already be in current use. It is true that experimental evidence, gained from work on animals, might be cited as contradicting this view, yet, impressed as we may be by results of animal experimentation in this field, it is a field in which particular care is called for in the formulation of conclusions and transference of them to the particular problem in the human being.

Our attention was attracted by a remark made by Ungley. "The diagnosis of pernicious anemia," he said, "should be carefully made before the patient is subjected to the prescription of a treatment for the rest of his life." This applies also to the diagnosis of subacute combined degeneration of the spinal cord.

More than sixty associated conditions or causes have been advanced to explain combined degeneration that often is said to be "just like that of pernicious anemia." If a reasonably typical clinical picture of subacute combined degeneration as it is seen in pernicious anemia is insisted on, and if a reasonably consistent pathologic picture is demanded, the situation resolves itself into something like this: The funiculi of the spinal cord may be altered by many diseases and in many ways. On the basis of a survey of the important available literature, it appears that this familiar and challenging picture may be brought about by chronic alcoholism (although five of six of Nonne's patients may well have had pernicious anemia), gastric carcinoma (especially of the pylorus), obstruction and fistulas of the intestinal tract, pernicious anemia, so-called prepernicious anemia and scurvy (but in this particular instance it may have been a complication). Possibly, it may be related similarly to pancreatitis, pellagra and hemolytic icterus, and it has been associated in some manner, possibly accidentally, with amyotrophic lateral sclerosis and a number of unclassified diseases. An important physiologic principle appears to be involved. Careful hematologic studies, gastric analysis and an investigation of the presence of Castle's factor probably would lead to the disclosure of some one underlying cause, presumably nutritional and in the nature of a deficiency state. In short, it might be postulated that an absence of Castle's factor probably is the only cause of the typical clinical and pathologic picture of subacute combined degeneration of the spinal cord.

In reviewing our group of approximately 2,000 cases in which the neurologic condition had been classified as "combined sclerosis" or "subacute combined degeneration of the spinal cord," we excluded all cases in which gastric analysis had revealed the absence of free hydrochloric acid. Thus, most, if not all, cases of pernicious anemia were eliminated.

There remained seventy-seven cases in which there were signs of involvement of the posterior and lateral columns of the spinal cord and in which free hydrochloric acid was present in the gastric contents. When to the objective signs is added the history of gradually developing, symmetric, persistent paresthesia of the hands and feet, the clinical neurologic picture becomes that seen typically in cases of pernicious anemia. There were eight cases in which these symptoms were present; in three of these there was no reason for believing that a nutritional factor had entered into the cause; in the remaining five there was reason for thinking so, although we do not venture to say that a pathologic examination in these cases would have disclosed classic subacute combined degeneration of the spinal cord. To borrow a term from the serologic laboratory, occasional "false positive results," which are indistinguishable clinically at a given time from those of the picture typically seen in cases of pernicious anemia, may be met. In cases in which the diagnosis is doubtful, examination of the spinal

fluid increases the accuracy of the diagnosis. In none of these cases could the exact pathologic nature of the lesion in the spinal cord be verified.

The important neurologic signs or symptoms which may be observed occasionally in cases of sprue, nontropical sprue and idiopathic steatorrhea, and which are dependent on organic involvement of the nervous system, usually express themselves as persistent acroparesthesia, depression of the tendon reflexes (especially those of the lower extremities), impairment of vibratory sensibility, as observed over the iliac crests and malleoli, and impairment of postural sensibility in the toes. In one of our cases the clinical observations were those of subacute combined degeneration of the spinal cord, and if persistent paresthesia may be so interpreted, degeneration of the peripheral nerves (although the tendon reflexes were not impaired). These clinical signs disappeared after the intensive intramuscular administration of liver extract.

Obviously, there are cases in which signs of degeneration occur in the posterior and lateral columns of the spinal cord, and yet one would hesitate to refer to them as "subacute combined degeneration" of the type seen in pernicious anemia. What is to be done in such cases? Although gliosis occurs in long-standing instances of subacute combined degeneration of pernicious anemia, it is not the reparative type of fibrillar gliosis that neurologists are accustomed to see in the presence of other lesions of the central nervous system. Hassin made the pertinent suggestion that these be called "combined sclerosis." This term, it seems to us, not only is useful, but also embraces the essence of the situation.

It would be proper to ask, "How would you distinguish the two conditions?" This is not always easy; indeed, if we could always do this we could save much hepatic substance, since, we venture to assert, the one condition responds to treatment with liver whereas the other does not. The cardinal distinguishing features, we should say, are the paresthesias; not only paresthesias, but persistent paresthesias, paresthesias not only in the feet but also in the hands, and not only on one side, but on both sides. It has been said, "The frequency with which numbness, tingling or pins and needles sensations are met with in severe anemias of whatever etiology or in vascular diseases unassociated with anemia, renders these subjective symptoms of little diagnostic value." With this assertion we do not find ourselves in entire accord.

Although involvement of the pyramidal tracts may dominate the picture, as evidenced by marked spasticity, we should be reluctant to make the diagnosis of subacute combined degeneration under such conditions. Also, we should be cautious whenever the findings are unusually asymmetric, for situations of this kind are encountered more often in combined sclerosis. The identification of multiple sclerosis may cause difficulty. The history of a previous disturbance of vision, such as transitory amblyopia or diplopia, and examination of the spinal fluid, may be helpful.

Since we have embarked on a rather pragmatic method of expression of this message, we are tempted to utilize it further. An impairment in vibratory sensibility is the most striking objective symptom in subacute combined degeneration A good tuning fork without a very audible sound and with a long duration of vibration is not easy to find. A fork having 256 vibrations per second is not so slow and coarse as to make the detection of minor impairment too difficult, nor yet so fast and fine as to make transmission to the bone, because of the integument, unreliable. The important factor is that the neurologist become acquainted with some one fork. A good way to begin is to place the fork on the patient's sternum and to make it clear to him just what is expected. Four regions, at least, should be tested: the sternum, the fingers, the anterior superior spines of the ilia, and the internal malleoli. Often the fork cannot be felt when it is placed over the malleoli, but it can be felt when it is placed over the iliac spines. When this occurs the neurologist must rely on other signs to decide whether the lesion is in the spinal cord or in the peripheral nerves. Impairment at the iliac spines suggests that the spinal cord is involved. Sometimes, forks provided with slots are used so that the duration of time over which the fork can be felt may be determined, or, the patient may be asked to notify the examiner at the moment the fork stops vibrating while it is being held to a part. Lack of attention or the nature of the paresthesias may make it difficult for the patient to do this. A procedure which seems to work reasonably well is that in which the fork or the finger of the examiner is placed at irregular intervals on the part examined, and

in which the patient is asked to report simply whether or not he feels the vibration. The residual vibration then may be determined by the placing of the fork on the examiner's own body.

This brings us to the question as to whether the symptoms and findings are not largely due to involvement of the peripheral nerves. The strongest clinical evidence in favor of this is that paresthesia usually begins in the terminal parts of the extremities, that impairment of the Achilles tendon reflexes is relatively greater than that of the patellar reflexes, and that there is peripheral sensory loss, which is sometimes marked. On the pathologic side are the observations of Hamilton and Nixon, who found marked degeneration of the peripheral nerves of patients who had pernicious anemia and once even found that the spinal cord was normal.

On the other hand, it is known that paresthesia of the distal parts of the extremities may occur in the presence of lesions of the central nervous system, such as tumors of the spinal cord. Again, often the paresthesia of pernicious anemia may creep up, so to speak, to involve the trunk. It is noteworthy, however, that the various types of truncal paresthesia often are of a different quality than those of the hands and feet. Possibly this difference may have a normal anatomic or physiologic basis, or it may be that simultaneous involvement of the central and peripheral nervous structures may bring this to pass. It should not be forgotten that in the presence of multiple peripheral neuritis paresthesias sometimes involve the trunk. To this may be added the fact that palsy or paralysis of the peripheral segments of the limbs and significant tenderness usually are lacking in pernicious anemia. Finally, the paresthesias of peripheral neuritis usually disappear after successful treatment; this is not always the case in pernicious anemia.

The work of Greenfield and Carmichael throws further light on this vexing problem. They found, on examination of the peripheral nerves in cases of subacute combined degeneration, a great difference in measurements as well as in counts of myelin sheaths in the nerves. Most of these sheaths were small and of poor staining quality. Examination of the axis cylinders, however, disclosed neither reduction in number nor alteration in the appearance of nerve fibers. That these changes in the myelin sheaths may produce paresthesia is not unlikely and that they do not produce paralysis similarly is not unlikely. We are probably not begging the issue by assuming that both peripheral and central lesions contribute to the clinical picture.

Summary

The symptoms that take place in the nervous system of most patients who have pernicious anemia are not at first caused by an anatomic break in the axis cylinder, but are related to edema, ballooning of myelin sheaths and other subtle processes. These symptoms are reversible when adequate treatment with liver is introduced. The initially focal changes eventually interrupt the anatomic continuity of the axis cylinder, and secondary degeneration is superimposed. When this occurs in the central nervous system, regeneration does not take place. The importance of early institution of treatment is apparent. Physical therapy, especially muscle-training exercises, is helpful. This applies particularly to patients who have not received early and adequate treatment.

The importance of an accurate diagnosis and of distinction between subacute combined degeneration and combined sclerosis has been emphasized. The diagnosis may be uncertain and in such cases results of lumbar puncture and jugular compression tests may be decisive. The farther the neurologist allows himself to deviate from the typical picture, the more likely he is to fall into error.

Finally, the question of the participation of the peripheral nerves in the production of the clinical picture has been described, and the opinion was ventured that involvement of these nerves does contribute to the clinical picture, but to a limited degree only.

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STAPHYLOCOCCUS AUREUS MENINGITIS WITH RECOVERY

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STAPHYLOCOCCIC septicemia, of itself, is not a particularly rare disease and since the advent of treatment with the sulfonamide group of drugs, especially sulfathiazole, recovery therefrom is fairly frequent. Herrell and Brown[11] reported forty-six cases of staphylococcus aureus septicemia treated at the Mayo Clinic prior to the use of sulfamido drugs with twelve recoveries, and twenty-seven cases treated with the sulfamido drugs with fifteen recoveries. Spink and Hansen[20] reported fifteen cases of staphylococcic sepsis treated with sulfathiazole with recovery of all.

Staphylococcic meningitis, on the other hand, occurs infrequently and recovery rarely occurs even with the best present day treatment. Findlay and Hammell,[8] Pewterbaugh,[16] Michels and Gonne[15] and others have stressed the high mortality in this disease. Findlay and Hammell[8] in 1939 stated: 'We feel that patients who have recovered from such a serious disease, deserve to have their cases reported in the literature for the help and guidance of others."

Michels and Gonne,[15] who reviewed the literature in 1938, found only eight cases of recovery from staphylococcic meningitis. The majority of these cases were not true generalized meningitis but were more characteristic of Schless' group I.[19] Since then, other scattered cases have been reported, most of them treated with the sulfamido drugs. The most recent article by Sadusk and Nielsen[18] in January, 1941, gave only twelve reported cases of recovery from the disease. The reported cases of staphylococcus aureus meningitis with recovery and the treatment used in each case are summarized in Table I.

TABLE I. REPORTED CASES OF RECOVERY FROM STAPHYLOCOCCUS AUREUS MENINGITIS AND TREATMENT USED

Author	Year	Treatment
Barker[1]	1925	Symptomatic
Lamb[13]	1928	0.1 per cent gentian violet
Stout[21]	1931	Bacteriophage and transfusion
Schless[19]	1932	Bacteriophage
Dunlap[7]	1935	Bacteriophage and 1:4000 acriflavin
Bliss and Hermann[2]	1936	5 per cent methyl rosaniline
Jackson[12]	1937	Cisternal and lumber punctures, blood transfusions and dextrose solution intravenously
Fritz and Hollister[9]	1938	Staphylococcus antitoxin, sulfanilamide, and blood transfusions
Bloch and Pacella[3]	1938	Sulfanilamide
Michels and Gonne[15]	1939	Sulfanilamide
Findlay and Hammell[8]	1939	Sulfanilamide
Pewterbaugh[16]	1939	Sulfanilamide and staphylococcus antitoxin
Gill[10]	1940	Sulfapyridine
Dietel and Kaiser[6]	1940	Sulfathiazole
Sadusk and Nielsen[18]	1941	Sulfathiazole and sodium sulfathiazole

There have been such a small number of cases reported over a relatively long period of time, all treated by different workers, that there is, as yet, no standard treatment for staphylococcus aureus meningitis. In recent years the sulfamido drugs have been used with encouraging

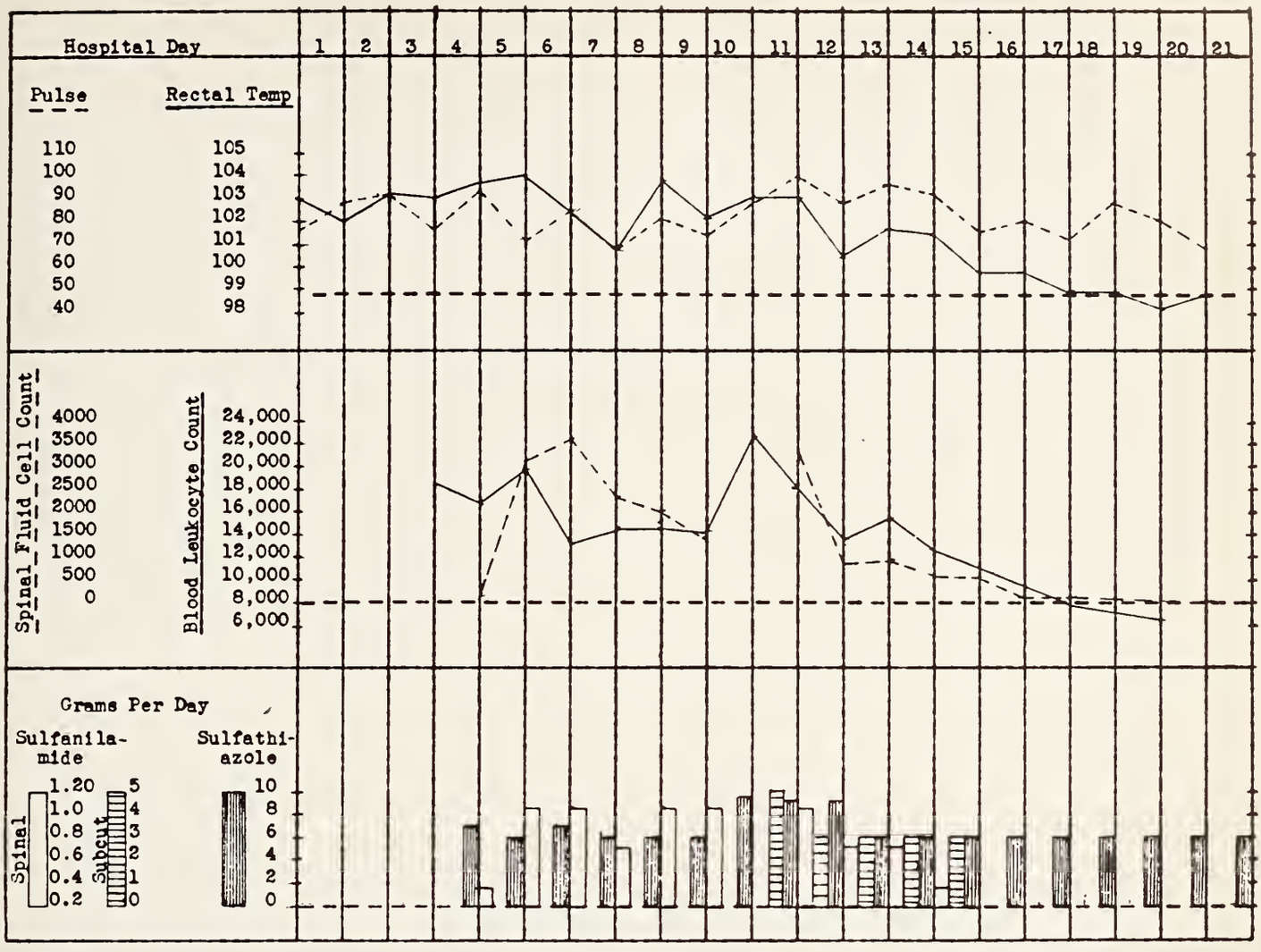


Chart 1. Graph showing range of temperature and pulse, spinal fluid cell count, blood leukocyte count, sulfanilamide and sulfathiazole therapy.

results. Accurate data on the incidence of staphylococcic meningitis is lacking. However, it is significant that in the three years since sulfamido drug therapy has been used in this condition, eight cases of recovery are reported, while previous to 1937, with all other forms of treatment, only nine cases of recovery were reported.

Schless[19] classified staphylococcic meningitis into two groups: (1) those cases, characterized by abscess involving the meninges and resulting from an extension of suppuration in a contiguous structure; (2) those characterized by meningitis with a positive staphylococcus aureus culture in the spinal fluid and negative or positive blood culture. According to Schless, recovery is extremely rare in cases which may be classified in this latter group.

The infrequent occurrence of staphylococcic septicemia and meningitis with recovery and the developmental state of the therapy in this disease lend medical interest to the following case report.

Case Report

C. P., a twenty-eight-year-old man of French-Indian descent, was first seen at the Reformatory Hospital on March 4, 1940, when he received his routine examination upon admission to the institution. There was nothing significant in his past history and his family history was negative. Examination revealed a large, well developed, well nourished male of dark complexion in apparent good health; no physical defects were noted. A urinalysis was negative. His blood pressure was 130/62. The Kline exclusion test was negative and the Mantoux test was negative after forty-eight hours. He was assigned to work on one of the construction crews and during the summer months was a star outfielder on the institution baseball team.

On the afternoon of October 26, 1940, he developed severe aching pain in the joints, particularly in the knees and in the lower back. In a short time he became feverish and began to have chilly sensations. On October 27, he felt worse and when undressing that evening he noticed an eruption on his upper arms and shoulders. He was then admitted to the institution hospital.

At that time he appeared feverish but not extremely

ill. The only positive findings not noted on admission to the institution were as follows:

1. The presence of a temperature of 102.4° F.

2. A skin eruption consisting of numerous red macules, one-half centimeter in diameter, with a tiny, pin-head size pustule in the center of each, distributed over the upper chest posteriorly, the upper part of the arms and shoulders, and on the lateral aspects of both hip joints.

3. A soft pre-systolic murmur at the apex of the heart.

These findings and the symptom of severe aching in the joints and back indicated a tentative diagnosis of acute rheumatic fever with erythema multiforme. He was put to bed and given twenty grains of sodium salicylate every four hours. There was very little change in his condition on October 28, but on October 29 it was definitely worse and obviously was not a case of rheumatic fever. His temperature was 103.2° F.(R). He still complained of severe backache. The pustules which had been the size of a pin-head, located in the center of a red macule, had increased in size until the lesions were entirely pustular. There was also a considerable increase in the number of these lesions.

The clinical picture was that of staphylococcic septicemia. Treatment with sodium salicylate was discontinued and a blood culture was taken. On October 30 his condition remained unchanged. His fever and bachache continued. The leukocyte count was 18,500 and the erythrocyte count was 4,600,000. Hemoglobin was 79 per cent, Sahli. Without waiting for the blood culture report, treatment was started with sulfathiazole, orally. An initial dose of four grams was given and was followed with one gram every four hours thereafter. That evening he began to complain of headache which gradually became worse until at 2:30 a.m., October 31, he required morphine for relief. At that time he had a slightly stiff neck and a spinal puncture was done. The fluid seemed to be under somewhat increased pressure and was slightly cloudy. The cell count was 150 per cubic millimeter with 90 per cent polymorphonuclears. Ten hours later, when a second spinal puncture was done, the pressure was 20 mm. of mercury, the fluid was quite cloudy and contained 1,359 cells, of which 85 per cent were polymorphonuclears. At this time the blood culture taken on October 29 was reported strongly positive for staphylococcus aureus. That evening meningeal symptoms became more marked; the neck was rigid and there was a bilateral positive Kernig sign. His temperature was 104.2° F. (R). Since a purulent meningitis had developed subsequent to the institution of sulfathiazole therapy, and was progressing, and since the work of Sadusk and Blake[17] showed that sulfathiazole does not readily diffuse into the spinal fluid, sulfanilamide was then given intrathecally. Forty to fifty c.c. of spinal fluid were removed every eight hours and replaced with 30 to 40 c.c of a 1 per cent solution of sulfanilamide. There was very little change until November 3 when the patient seemed definitely improved. His temperature had declined to 100.8° F. (R) and the skin lesions were beginning to dry up and disappear. Although the neck was still very rigid and the Kernig sign was still present, the leukocyte count was down to 13,400 and the spinal fluid contained only 940 cells per cubic millimeter. That day only two spinal punctures were done in 24 hours and on November 4 he was very much worse. His temperature was 103.8° F. (R); meningeal symptoms were more marked and headache was more severe. The spinal fluid contained 2,000 cells per cubic millimeter. The eight hour schedule of spinal piunctures with administration of sulfanilamide was therefore resumed.

On November 5 his condition becoming steadily worse, the dose of sulfathiazole was increased to two grams for one dose followed by one and one-half grams every four hours thereafter. Although the blood had been rapidly sterilized of organisms (a second blood culture taken two days atfer instituting sulfathiazole therapy was reported negative), the meningitis appeared to be progressing unfavorably. On November 6 his condition was critical. His temperature was 103° F. (R). He was very weak and irrational and the spinal fluid was so thick that it would not drain from the spinal puncture needle. Being unable to give more sulfanilamide intraspinally and not wishing to give it orally in addition to sulfathiazole, a one per cent solution of sulfanilamide was given by hypodermoclysis; 500 c.c. was given that day and 300 c.c. on each of the next four days. On November 7 the spinal fluid was much thinner and the intrathecal route was again utilized for sulfanilamide administration. His condition continued to improve gradually. On November 8, the dosage of sulfathiazole was decreased to one gram every four hours. By November 10 he was greatly improved. His temperature was 101.4° F. (R). His neck was no longer stiff. The spinal fluid contained only 597 cells per cubic millimeter. At this point sulfanilamide was discontinued. The temperature fell to normal November 11, then rose slightly; again returned to normal November 12 and thereafter remained normal. The spinal fluid cell count, however did not reutrn to normal until November 16. A dose of one-half gram of sulfathiazole orally was continued every four hours for two weeks to prevent the possibility of a recurrence.

Although the patient lost considerable weight during the acute illness he recovered rapidly. Daily determinations revealed no more depression of the red blood cell count than one would expect with any severe infectious disease. Cyanosis was never a prominent symptom in spite of very large doses of both sulfathiazole and sulfanilamide. Liquid Citralka (Parke-Davis) was given in one dram doses every four hours to combat any tendency to development of acidosis. Urinary retention was a problem for several days during the acute stage when he had to be catheterized regularly, but repeated urinalyses were negative. Complete recovery occurred without complication and he was discharged from the hospital January 15, 1941.

Comment

In view of more recent investigations, the combined dosage of sulfanilamide and sulfathiazole used in treating this case may seem unnecessarily large. However, in a disease with such a high mortality rate and wherein a standard effective dosage of the drug is not established it is justifiable to overmedicate as long as toxic reactions to the drug do not supervene.

It is possible that the development of meningitis in this case might have been prevented had the septicemia been evident sooner and treatment with sulfathiazole started more promptly. Gill's case was similarly mistaken for rheumatism and treated with salicylates before the correct diagnosis was made.

Spink and Hansen[20] have demonstrated that sulfathiazole is the most effective known agent in the treatment of staphylococcic septicemia but this drug has not been materially efficatious in the treatment of meningitis. Dietel and Kaiser[6] have reported the successful treatment of one case of staphylococcic meningitis with sulfathiazole alone, but there has, as yet, been no duplication of this result. In our case, although the septicemia responded rapidly to treatment with sulfathiazole (blood culture negative after forty-eight hours and rapid healing of skin lesions), the meningitis did not improve. Sadusk[17] and coworkers found that sulfathiazole does not readily diffuse into non-inflammatory cerebrospinal fluid. Spink and Hansen[20] found the same to be true in purulent fluids and this latter finding was confirmed by Sadusk and Nielsen.[18] From these findings it follows that sulfathiazole will not be very effective in meningitis.

Although much experimental work indicates sulfanilamide is ineffective against staphylococcus aureus both in vitro[4] and in mice,[5] nevertheless, clinically in man, sulfanilamide has proven to be definitely effective in staphylococcic infections. Six of the reported cases of recovery from staphylococcic meningitis were treated with this drug.

Sadusk and Nielsen's[18] report of a case of staphylococcus meningitis successfully treated by the combined administration of sulfathiazole orally and sodium sufathiazole intraspinally and intravenously holds out great promise that the latter drug may prove to be as effective in meningitis as sulfathiazole is in septicemia. Meantime, however, it seems wise to combine the oral administration of sulfathiazole with the intrathecal administration of sulfanilamide in the treatment of staphylococcic meningitis.

Summary

1. A brief review of the literature on staphylococcic meningitis is presented.

2. A case of staphylococcic septicemia and meningitis is reported.

3. Though sulfathiazole sterilized the blood within forty-eight hours, it did not appear to alter the course of the associated meningitis.

4. The oral use of sulfathiazole combined with the intrathecal administration of sulfanilamide proved effective in this case.

5. No toxic reactions developed from the combined use of these two drugs and complete recovery from the disease was effected without complications.

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CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL
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GENERALIZED LYMPHOSARCOMA

The case is that of a fifty-nine-year-old white woman who was first admitted to the hospital on November 30, 1940, where she was a patient on the Neurological Service for six days. There it was learned that she had been perfectly well until on the day of admission, when she had a series of attacks of epileptiform seizures which were followed by a period of unconsciousness. She had never hand any convulsions previously. She was examined by her private physician, who told her that she had high blood pressure and advised that she come to the hospital. Her past history revealed that she had had the usual childhood diseases. There had ben no surgical operations or any injuries. She denied venereal disease. She had never complained of headaches or fainting spells. There was no blurring of vision, diplopia, or tinnitus. Recently she had had some dyspnea on exertion but no orthopnea. For the past two weeks the patient's appetite had been somewhat decreased. Further history was irrelevant.

When the patient was first seen in the hospital, she was in a state of epileptiform seizure which lasted about two minutes. Following the attack she remained in a semi-stuporous condition for about two hours. When she awoke she was clear mentally. The patient was a well developed and very obese woman. The pupils were equal and reacted to light and accommodation. Examination of the chest revealed a few moist râles at the bases of both lungs. The cardiac dulness was slightly enlarged to the left. A systolic murmur was heard at the apex of the heart. The rhythm was regular and the pulse rate was 90 per minute. The blood pressure at this time was 150/94. The abdomen was extremely obese. No abdominal masses were noted, although the examiner was handicapped because of the extreme thickness of the abdominal wall. There was no abdominal tenderness. The left leg was larger than the right and there was a two plus pitting edema on the left and minimal edema on the right. Neurological examination was done after the patient regained consciousness but no abnormalities whatsoever were found. The ocular fundi were normal.

Laboratory findings were reported as follows: The urine had a specific gravity of 1.018. It contained a faint trace of albumin but no sugar. There were no casts or erythrocytes, and only an occasional pus cell per high power field was seen. The hemoglobin was 70 per cent; the erythrocyte count was 3,800,000 per cubic millimeter; the leukocyte count was 6,350 with a normal distribution. The fasting blood sugar was 106 mg. per cent.

On the first hospital day, the patient had two more convulsions, despite sedation, which lasted about two minutes each. These were followed by short periods of semi-consciousness but left no permanent residual effects. Following the first convulsive seizure, the blood pressure was 250/96 and following the last seizure it was 170/70. Treatment in the hospital consisted of further sedation and limited activity. No further convulsions occurred and the patient was discharged on the sixth hospital day with a tentative diagnosis of idiopathic epilepsy.

The patient was then followed in the Out Patient Department where it was noted that a mass was present in the abdomen. On pelvic examination it was found that there was some thickening of the anterior vaginal wall. She was readmitted to the hospital on December 14, 1940, in order that a biopsy of the vaginal mass might be done. She now stated that since her discharge from the hospital, she had experienced pain in the lower part of her abdomen and had lost some in weight. Physical examination was essentially the same as on the previous admission. The blood pressure was now 142/88. Examination of the abdomen again revealed the marked obesity but the abdominal wall was now relaxed. A mass seemed to rise from the pelvis to about the level of the umbilicus. It was described as being very hard and irregular in outline. The liver was palpable four centimeters below the costal margin in the right midclavicular line. It was not tender. There was three plus edema of the entire left lower extremity. Pelvic examination revealed normal external genitalia. There was a very firm, nontender mass in the region of the anterior vaginal wall. It seemed to be attached to the mass in the abdomen. There was no uterine or vaginal bleeding.

Laboratory Findings.—The urine was negative save for a faint trace of albumin. The hemoglobin and leukocyte counts were the same as before. Serologic tests for syphilis were negative. An x-ray examination of the chest revealed no abnormality in either the lungs or heart.

On December 17 the patient had a series of convulsions in rapid succession which were followed by a period of unconsciousness lasting for several hours.

Following this a definite change was noted in her condition. Throughout the remainder of her hospital stay, she was conscious for only a few minutes at a time. On January 6 her blood urea nitrogen was 46 mg. per cent and the creatinine was 4 mg. per cent. The uric acid was 9.7 mg. per cent. Examination of the spinal fluid revealed it to be entirely normal. She continued to have an occasional convulsion daily. She was unable to eat and became uncoöperative and incontinent of both urine and feces. Four days before her death, she developed signs of bronchopneumonia. Chemotherapy in the form of sulfathiazole was instituted but she did not respond and died on January 23, 1941.

Anatomical findings (Dr. John Farkas): The body was estimated to weigh about 220 pounds. There was a two plus pitting edema of the left leg up to the groin. There was no jaundice. The pupils were regular and equal. The superficial abdominal fat was 8 cm. in thickness. The peritoneal surfaces were smooth and glistening but several white nodules of tumor tissue were noted under the parietal peritoneum near the midline of the abdominal wall. There were rather firm adhesions about the loops of small bowel in the lower abdomen which firmly attached the bowel to the bladder, rectum, sigmoid colon, and to the large mass of tumor tissue which completely filled the pelvis and the lower portion of the abdomen. The appendix was normal. The liver extended 10 cm. below the right costal margin. The pleural cavities and pericardial sac were negative. Several small, raised nodules about 1 cm. in diameter were found on the fourth and fifth ribs on the left side and in the costal margin in the anterior axillary line.

The heart was of normal weight. There were three pearly white, firm nodules measuring ½ to 1 cm. in diameter within the wall of the right auricle. No other metastases were noted in the heart. The valves, myocardium, and the coronary arteries were otherwise negative. The root of the aorta was normal. The lungs were considerably increased in weight but showed only bronchopneumonia. The spleen was about three times its normal weight but cut sections revealed no abnormalities. The liver was greatly increased in size weighing 3,400 grams. In its right lobe was a large globular mass measuring 15 cm. in diameter. A similar mass was found attached to the upper surface of the left lobe measuring about 9 cm. in diameter. These tumor nodules were soft in consistency, having necrotic centers. Other tumor masses were found within the substance of the liver. The gall bladder was negative and the common bile duct was patent.

The entire pelvis and abdomen were filled with a huge mass of tissue which extended from one iliac fossa to the other. The tumor mass infiltrated the uterus, the bladder, and the rectum. This mass weighed 4,000 grams. The pancreas and adrenal glands were normal. The right ureter was occluded by tumor tissue and the proximal portion of the ureter and the kidney pelvis were dilated. The abdominal aorta was surrounded by tumor tissue as was the vena cava. The mesenteric lymph nodes were greatly enlarged.

Upon opening the skull, several masses of pale, pink tissue measuring 3 to 6 cm. in diameter were found to replace the bone completely over the frontal parietal region. They did not penetrate the dura mater but pressed upon the brain substance. There were no metastases within the brain or any other abnormality.

Anatomic Diagnosis—Generalized lymphosarcoma.

Discussion

Dr. Frank C. Andrus: I was surprised to find that histologically this tumor was a malignant lymphoblastoma of the lymphosarcoma type. There are two concepts of lymphosarcoma; the first, that of a local tumor spreading to the regional lymph nodes and usually arising in the pharynx or small intestine: the second is a generalized form which in its clinical behavior resembles Hodgkin's disease. In fact there are numerous cases which might be regarded as a transition between the two diseases. Fever may occur in lymphosarcoma as in Hodgkin's disease; both cause neurological symptoms by forming epidural infiltrations which press upon the underlying nervous tissue as was the case in this patient. I have seen several patients who were operated upon for a spinal cord tumor and a lymphosarcoma or Hodgkin's tissue were found.

Lymphosarcoma is the most common tumor of the small intestines, where it usually produces the symptoms of intestinal obstruction. Some of these have been cured by excision. This is one of our most radio-sensitive tumors and the mass may entirely disappear after treatment. The second generation of tumor cells, however, are radio-resistant, and the disease is almost uniformly fatal. The edema of the legs in this patient was due to obstruction of the pelvic veins. It seems probable that the elevation in uric acid was due to the increased destruction of nucleoprotein in the leukocytes.

Dr. J. S. McCartney, Jr.: Here we have a tumor which is involving only part of the lymphatic system and a relatively small part of it. The major portion of the tumor is not in the lymphatic structures except for those in the abdomen. However, from the microscopic studies it fits in perfectly with lymphosarcoma. We have seen many examples of lymphosarcoma arising in the intestinal tract, commonly with involvement of the regional lymph nodes.

Dr. George Fahr: Where did the tumor actually start? Do you assume that it started in the pelvis, or don't you know?

Dr. McCartney: We cannot definitely say. At the time we examined the patient we had the rectum, vagina, bladder, retroperitoneal lymph nodes, bones, and other tissues all involved.

Dr. Andrus: We might assume that in this type of lymphosarcoma, the tumor arises as a system disease such as does leukemia in which many tissues appear to undergo the change simultaneously.

Dr. Fahr: Can a lymphosarcoma start in the lymphoid tissue of any organ?

Dr. McCartney: Presumably it can; we most often see it in the lymphoid tissue of the submucosa of the intestine or the stomach. The gastric wall may attain a thickness of 4 to 5 cm.

Dr. Andrus: Quite a few people who have studied this condition feel that occasionally the tumor cells enter the peripheral blood giving rise to a leukemic phase. They feel that, on the basis of the clinical

course and the morphology of the cells under special staining methods, this leukemic picture called "leukosarcoma" should be distinguished from pure lymphatic leukemia.

Dr. Alex Blumstein: I believe that any patient who presents himself with the symptoms of convulsions should certainly have a film of the skull studied because there is no real way to distinguish between idiopathic epileptiform seizures from symptomatic convulsions. I do not know why I did not suggest an x-ray of the skull in this case. When I saw her I did not even suspect systemic metastases. Another diagnostic possibility, when an adult presents herself with convulsive seizures, is that of hypertensive encephalopathy.

Dr. Fahr: If these diastolic blood pressure readings were correct, I do not believe it likely that she had hypertensive encephalopathy, particularly in the absence of choking of the optic discs. However, occasionally with acute hypertension such as may be seen in glomerulonephritis, hypertensive encephalopathy may occur when there is no papilledema. As a rule the blood pressure is very high before symptoms of hypertensive encephalopthy appear.

Dr. Andrus: Dr. Blumstein, do you often see idiopathic epilepsy making its first appearance in a woman of fifty-nine years of age?

Dr Blumstein: It occurs rarely and even at autopsy one is unable to find any lesion whatsoever. However, it is an excellent general rule to follow that when the seizures come after the age of forty years, some definite organic change is present.

CASE REPORTS

HYPERTENSION ASSOCIATED WITH MITRAL STENOSIS

Report of Forty-Four Cases

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THE study on which this report is based was made to determine the incidence of hypertension in cases of mitral stenosis and the prognosis in cases in which these two conditions are associated.

In order to determine the incidence of hypertension in individuals with mitral stenosis, we studied 1925 consecutive cases of mitral stenosis observed at the Mayo Clinic. Hypertension was present in forty-four of these cases. In order to facilitate the analysis of our findings, these forty-four cases will be designated as group 1. We also made a study of 163 patients with mitral stenosis in which there was no evidence of hypertension. These 163 cases will be designated as group 2.

Incidence.—Hypertension was present in forty-four, or approximately 2.3 per cent, of the entire series of 1925 cases of mitral stenosis. This would indicate that hypertension is not frequently associated with mitral stenosis.

Clinical Data—In group 1, that is, in the forty-four cases in which hypertension was associated with mitral stenosis, eleven of the patients were men and thirty-three were women (table 1). In group 2, that is, in the 163 cases of mitral stenosis in which there was no evidence of hypertension, fifty-six of the patients were men and 107 were women.

The average age of the patients in the cases in group 1 was fifty-one years. The youngest patient in this group was thirty years of age and the oldest patient was sixty-seven years of age. In the cases in group 2 the average age of the patients was thirty-nine years. The oldest patient was sixty-three years and the youngest patient was nineteen years of age respectively.

In the cases in group 1 the average values for the systolic and diastolic blood pressures were 183 mm. and 108 mm. of mercury respectively. The highest values were 250 mm. systolic and 130 mm. diastolic. The lowest values were 152 mm. systolic and 90 mm. diastolic. There was no instance of hypertension group 4, or malignant hypertension, in this group of cases. The hypertension was classified as follows: group 1 or 1+ in thirty-three cases, group 2 in ten cases, and group 3 in one case. In other words, the hypertension was mild in this group of cases.

The values for the systolic and diastolic pressures were normal in all of the cases in group 2.

Auricular fibrillation was present in twenty, or 45 per cent, of the cases in group 1 and in forty-two, or 25 per cent, of the cases in group 2.

Various degrees of congestive heart failure were present in twenty-seven, or 61 per cent, of the cases in group 1. In eight of the twenty-seven cases the heart failure was due chiefly to the hypertension; in nine cases it was thought to be due to both hypertension and mitral stenosis; and in ten cases it was due chiefly to the mitral stenosis.

In the cases in group 1, ten, or 22 per cent, of the patients died. Necropsy was performed in four of the ten cases. The causes of death in the four cases were as follows: heart failure resulting from mitral stenosis in two cases, acute coronary occlusion in one case and cerebral thrombosis in one case. In the cases in group 2, seven, or 4 per cent, of the patients died.

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Comment

The difference in the average age of the patients in the two groups of cases might be a factor in the difference in the clinical data in the two groups. As a general rule, mitral stenosis is liable to be more severe in a group of patients whose average age is thirty-nine years than it is in a group of patients whose average age is fifty-one years. The fact that patients who have mitral stenosis live to become fifty-one years of age is evidence that their mitral stenosis is not severe. In cases in which mitral stenosis is severe, patients as a rule do not live to reach an average age of fifty-one years.

It is significant that the incidence of auricular fibrillation was 45 per cent in group 1 but only 25 per cent in group 2. The incidence of cardiac decompensation was 61 per cent in group 1 but only 18 per cent in group 2. The mortality rate was 22 per cent in group 1 but only 4 per cent in group 2.

We are conscious of the fact that too definite conclusions cannot be drawn from a study of just two groups of cases. Several factors greatly affect the results obtained. The severity of mitral stenosis is so variable that this alone could greatly affect the results. The mortality in our group of cases of mitral stenosis and hypertension was five times as high as it was in cases in which there was no evidence of hypertension. From this study, we conclude that patients who have mitral stenosis are not benefited by the development of hypertension but, on the other hand, are made definitely worse.

TABLE I.—CLINICAL DATA IN CASES IN GROUP 1 AND GROUP 2

Clinical data		Group 1 (forty-four cases in which hypertension was associated with mitral stenosis)	Group 2 (163 cases of mitral stenosis in which there was no evidence of hypertension)
Age, years	Oldest	67	63
	Youngest	30	19
	Average	51	39
Sex	Men	11	56
	Women	33	107
Blood pressure, mm. of mercury	Highest value	250/130	Normal
	Lowest value	152/ 90	
	Average value	183/108	
Auricular fibrillation	Number of cases	20	42
	Percentage of cases	45	25
Congestive heart failure	Number of cases	27	29
	Percentage of cases	61	18
Deaths	Number	10	7
	Per cent	22	4

TUBERCULOSIS AMONG COLLEGE STUDENTS

Ten years ago no more than a dozen school health administrators were actively seeking out tuberculosis among the students in colleges and universities, despite the acknowledged predilection of the tubercle bacillus for those of this age group. Today 248 institutions of higher learning have some form of program for the finding of tuberculosis on the campus. The Tenth Annual Report of the Tuberculosis Committee of the American Student Health Association is both a record of progress and a reminder of what is still to be done.

MISCELLANEOUS

ENCEPHALITIS IN MINNESOTA

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IN view of the number of cases of encephalitis and the considerable increase in equine encephalomyelitis this year, the following notes relative to our local mosquito potential vectors may be of interest to physicians.

To the present time ten species of mosquitoes have been proved capable of transmitting equine encephalomyelitis under laboratory conditions, although the extent to which the disease is insect borne is yet to be determined. There is no reason to doubt that some of these mosquitoes and probably related species may serve as vectors under natural conditions. It is still true that, contrary to the malaria situation, no infected wild mosquitoes have ever been taken.

The experimentally implicated mosquitoes are the following species:

Ædes ægypti	*Ædes vexans*
Ædes albopictus	*Ædes triseriatus*
Ædes cantator	*Ædes nigromaculis*
Ædes sollicitans	*Ædes dorsalis*
Ædes tæniorhynchus	*Ædes atropalpus*

Of these mosquitoes, the first two are tropical and subtropical species not found in the northern United States. The next three, *canator, sollicitans* and *tæniorhynchus* are salt marsh mosquitoes which do not occur in Minnesota. The remaining five species are present in varying numbers, dependent on seasonal conditions.

Ædes vexans.—The most widely distributed and abundant is *Ædes vexans,* a species which Kelser early found capable of transmitting the virus. We have records of its presence in practically every county in Minnesota in which collecting has been done, though it is relatively uncommon in coniferous forest areas. In favorable seasons, it may appear in great numbers in late May, and in subsequent waves throughout the season. Such seasons we had in 1937 and 1938 when there was widespread complaint regarding mosquito abundance. To a much less extent the present season has been one of unusual abundance of this species.

An index of conditions in 1937 and 1938 is afforded by the relative abundance of *Ædes vexans* in trap catches. In 1937, a single trap at Crystal Bay, Lake Minnetonka, yielded 34,553 mosquitoes of which 30,885, or 89.49 per cent, were this species. In 1938 the total catch in four traps in the Twin Cities area, including Crystal Bay, was 337,960 mosquitoes, of which 332,176, or 98.28 per cent, were of *vexans.* Traps at University Farm, Cedar Lake, Nokomis and at Crystal Bay showed marked similarity in percentages of *vexans,* in spite of dissimilarities in general environment. A hand catch of 4,166 in the summer of 1938 included 2,755, or 66.13 per cent of *vexans.* The low percentage, as contrasted with that from the traps was due to the excessive numbers of *vexans* which led the collectors to neglect collecting them, rather than to these mosquitoes attacking less frequently than did other species. On the other hand, in 1939 it was present throughout the area in such small numbers that there were no complaints of mosquito annoyance. In 1940 it was again of very secondary importance. That year it constituted only 14.6 per cent of a limited hand catch in the Army Maneuvers area.

While *Ædes vexans* attacks most readily in the shade our experience does not support the conclusion of the Massachusetts' workers that it is a woods species and that "perhaps one-half of the exposures to *Ædes vexans* would be eliminated simply by keeping away from the woods."

This species is preëminently a migratory species, as has been demonstrated by several workers who have sprayed enormous numbers of the mosquitoes with anilin dyes and subsequently caught marked specimens as far as fifteen miles distant. One worker reports taking specimens thirty miles from the nearest breeding place, but that record must be accepted with some reservation.

Ædes nigromaculis.—Madson and Knowlton, working in Utah, demonstrated that this species was a potential carrier of the western strain of equine encephalomyelitis, by transmitting the infection to healthy guinea pigs by the bites of *nigromaculis* which had fed on diseased guinea pigs. Attempts to transmit the infection to horses were unsuccessful. The species is relatively rare in Minnesota and most of our records relate to its presence in the prairie sections. However, we have taken it at University Farm, Cedar Lake, Crystal Bay and in the Army Maneuvers area. In 1938 it constituted 0.01 per cent of the total trap catch and was not present in the hand catch of 4,166 total.

Ædes dorsalis.—Madson, Knowlton and Rowe, 1936, reported positive results with six out of 244 attempts with guinea pigs. While this species is usually regarded as a prairie species, it is not uncommon in the Twin Cities area. In 1938 it was represented by 875 specimens, or 0.26 per cent, in the trap catch and 281, or 6.75 per cent, in the hand catch.

Ædes triseriatus.—Dr. W. A. Davis, 1940, working in Massachusetts, was the first to implicate this species. Specimens which had fed on an infected pigeon and others on an infected mouse, transmitted the infection

(Continued on Page 706)

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HOMEOPATHIC AND ECLECTIC MEDICINE IN MINNESOTA*

By James Eckman

Rochester, Minnesota

(Continued from July issue)

Homeopathic Hospitals

One of the outstanding characteristics of supporters of the homeopathic school of medicine in the United States in the Nineteenth Century was their ability to attract prominent figures to the defense of their interests. Packard,[38] for instance, has shown that in New York City William Cullen Bryant (1794-1878) served as president of the board of trustees of the Homœopathic Medical College of the State of New York from 1862 to 1872, and in Minnesota personages no less imposing in local renown supported homeopathy and its institutions for many years. William D. Washburn (1831-1912), president of the Minneapolis and Saint Louis Railway Company and a United States Senator from Minnesota, was elected president of the board of trustees of the Minnesota Homœopathic Medical College at its organization on May 25, 1886,[39] and Senator Washburn and Frederick C. Pillsbury[40] (1852-1892), miller and president of the Minneapolis, Lyndale & Minnetonka Railway Company, in 1886 was elected to the board of directors of the Minneapolis Homœopathic Hospital Association. Thomas Lowry (1843-1909), founder of the Twin City Rapid Transit Company, in 1886 gave $500 in cash toward erection of the annex to the Minneapolis Homœopathic Hospital at Twenty-fifth Street South and Clinton Avenue.[41] Charles M. Loring (1833-1922), for years president of the Minneapolis Board of Park Commissioners and known afar as the "father of the Minneapolis park system," gave $400 in cash to the same project.[41]

In Saint Paul the successes of the homeopaths were even more spectacular. When in the spring of 1887 a proposal was made to erect a homeopathic hospital on Agate Street between Acker and Granite Avenues, former Governor William R. Marshall (1825-1896) was elected to the board of directors of the projected institution; so also was William R. Merriam (1849-1931), governor of Minnesota from 1889 to 1893. Incorporators of the hospital included such men as United States Senator Cushman K. Davis (1838-1900); Alexander Ramsey (1815-1903), former governor of Minnesota, United States Senator and Secretary of War; James J. Hill (1838-1916), creator of the mighty Great Northern railway empire; Edmund Rice (1819-1889), president of the Saint Paul and Pacific Railroad Company and a Congressman; and Charles E. Flandrau (1828-1903), former associate justice of the Supreme Court of the Territory of Minnesota and justly famous in the annals of Minnesota history.[42]

Cottage Hospital.—This early Minneapolis institution was not primarily homeopathic. Hamilton[43] has shown, however, that homeopathic physicians were active in founding Cottage Hospital in 1871, in association with Dr. A. E. Ames (1814-1874) and the Brotherhood of Gethsemane. It was said to be the first private

hospital established in Minneapolis. In 1877 Dr. A. A. Camp (1854-1888) and Dr. W. H. Leonard (1825-1907) were the homeopathic members of the staff of this hospital.

Sister Annette Relf's Homeopathic Hospital.—A woman whom homeopaths called "Sister Annette Relf" started a children's homeopathic hospital in Minneapolis in 1882, and by 1886 she had cared for 160 patients. In 1886 this hospital was situated at 2110 Fifth Avenue South in Minneapolis. It is not clear what its official name was.

Stillwater Homœopathic Hospital.—Description of this pioneer hospital was made by Dr. William H. Caine[44] (1854-1902) of Stillwater in 1882:

> On March 27, 1881, we organized a Homœopathic hospital in Stillwater, and since that date have treated fifteen fractures, had eight amputations, thirty-five cases of lacerated wounds, two dislocations and performed four miscellaneous operations. The hospital has succeeded beyond our expectations; we have been careful to keep our running expenses low, and are to be congratulated because we are out of debt. In fractures of the femur, for dressing, we prefer the double inclined plane, having used it in every case but one, where we applied the counter extension and the sandbags. In fractures of the tibia and fibula we use at first the double inclined plane, and after ten days or so follow it with the plaster-of-paris dressing. In fractured clavicles we use the Sayre dressing, with adhesive straps.

It has been written[45] that this particular homeopathic hospital did not long endure. Dr. Caine, who was house physician and surgeon, in the spring of 1883 was working at the "regular" Stillwater City Hospital, which would suggest that the homeopathic hospital had been closed. Oculist and aurist to the Stillwater Homœopathic Hospital was Dr. Alexander Donald (1846-1921) of Saint Paul. Dr. Henry Hutchinson (1849-1910) of Saint Paul and Dr. Otis M. Humphrey (1832-1911) of Minneapolis were consulting physicians.[45] "This hospital was also supported partly, at least, by benefit parties, records of which appeared in the newspapers of the time."[45]

Dr. Charles N. Dorion (1834-1894) of Saint Paul for a while was consulting surgeon to this hospital, and is worthy of mention herein. He came to Saint Paul in 1878. In 1873 and 1874 he had been professor of anatomy in the Hahnemann Medical College and Hospital of Chicago; in 1874 he had been appointed adjunct professor of obstetrics in the Chicago school.[32] He had also, with Dr. A. Claude of Paris, translated *Lectures, Clinical and Didactic, on the Diseases of Women,* into French.[32] The work had been written by Dr. Reuben Ludlam (1831-1899), a professor in the aforementioned college, and co-editor of the old *United States Medical and Surgical Journal,* a homeopathic organ.

Minneapolis Homœopathic Hospital.—In about 1882 a group of Minneapolis women interested in homeopathy founded the "Hahnemann Ward Association" and installed a "Hahnemann Ward" in a rented building at Ninth Street and Eighth Avenue South.[35] Homeopathic practitioners and their supporters then bought for $5,000 a lot on Eighth Street, and sold it to the City of Minneapolis for $10,000. The next step was purchase of a building at Fourth Avenue South and Twenty-fifth Street. Homeopaths paid $25,000 for this structure, utilizing the $10,000 they had received from the city, and assuming a mortgage of $15,000 for the remainder of the purchase price.[35] Possession of this building was taken in February, 1884. It was this hospital which was utilized for students of homeopathic medicine when in 1886 the Minnesota Homœopathic Medical College was founded. In 1886 an annex to the hospital was erected.[41]

Status of the Minneapolis Homœopathic Hospital in 1887 was evaluated by the

Saturday Spectator for December of that year, as reprinted by the *Minnesota Medical Monthly*:[46]

Minneapolis Homœopathic Hospital

We clip the following from the Superintendent's report in the Christmas edition of the *Saturday Spectator:*

"The organization of this institution was an absolute necessity, owing to the fact that the city was distributing its sick among the various hospitals, and to a great many of the patients then, as now, 'old school' treatment was positively an affliction. That those preferring homœopathic treatment might have it, the hospital was opened in November, 1882.

"At present about forty patients can be accommodated, at prices ranging from $6 to $15 per week. While a private patient may choose a physician of any school to treat him, all charity and hospital patients are under the care of the hospital staff, composed of nine competent homœopathic physicians. As a proof of their efficiency, as well as that of the hospital management, out of fifty-three cases of typhoid fever cared for during the past summer and fall, but *four cases,* or less than 8 per cent, resulted fatally. A special ward is set aside for the care of lying-in patients, and to unfortunate girls, or those without means, a helping hand is extended. Another special feature is a ward, and the only one in the city, for the reception of contagious diseases; here as in the other wards, a patient may choose his own physician or employ a member of the hospital staff."

Maternity Hospital.—It was written that Maternity Hospital was opened in Minneapolis on November 30, 1886, at 609 Eight-and-a-Half Street.[47] It had a staff of three women homeopathic physicians, and a consulting staff consisting of Dr. Philo L. Hatch (1823-1904), Dr. William H. Leonard (1825-1907) and Dr. Adele S. Hutchinson (1847-1909). It was proclaimed as "the only one of its kind in the city or state" in 1887,[47] and functioned as a lying-in hospital for married women and for unfortunate, but not depraved, unmarried girls. This institution is still in existence (1940) and is situated at 2215 Glenwood Avenue in Minneapolis. It has thirty-six beds and thirty-six bassinets, and is nonprofit-making. Attached to it is the Ripley Memorial Hospital, named for Dr. Martha G. Ripley (1843-1912), one of the homeopathic women physicians of the first staff of the hospital.

Saint Paul Homœopathic Hospital.—Little is known about this hospital. Armstrong[48] has demonstrated that in 1887 it was opened at 800 Agate Street in Saint Paul but it did not endure long. Plans were made in the spring of 1887 for the erection of a homeopathic hospital on Agate Street between Acker and Granite Avenues in Saint Paul,[42] and it is no doubt this institution to which Armstrong[48] referred. On February 1, 1888, at Armory Hall, in Saint Paul, a "grand charity ball" was held for the benefit of the Saint Paul Homœopathic Hospital, but the situation of the hospital itself was not mentioned in the announcement of the ball.[49]

Minneapolis Free Homœopathic Dispensary.—Aldrich[36] said that this unit was established at the old Cottage Hospital in Minneapolis by William H. Leonard. It was supposed to have been transferred to the Minnesota Homœopathic Medical College when that institution was founded in 1886. When the University of Minnesota College of Homœopathic Medicine and Surgery was organized, the free dispensary was moved to the grounds of Saint Barnabas Hospital in Minneapolis. Aldrich[36] wrote that it was finally reorganized as the University Homœopathic Free Dispensary.

Saint Paul Homœopathic Free Dispensary.—This dispensary was opened on July 18, 1887, at 181½ East Seventh Street in Saint Paul. It is not known how long it existed.

Pharmacies.—For drugs and materia medica, Minneapolis homeopaths repaired to the pharmacy of Thomas Gardiner at 306 Nicollet Avenue. This pharmacy was founded in 1869; prior to that year Gardiner had been a member of the firm of William H. Leonard & Company, Drugs. Later, the Philadelphia firm of Boericke and Tafel had a pharmaceutical house in Minneapolis; it was succeeded by the Minneapolis Pharmacy Company, which published the *Minneapolis Homœopathic Magazine.* The Saint Paul Homœopathic Pharmacy was situated at 109 East Seventh Street, not far from the Saint Paul Homœopathic Free Dispensary. A pharmaceutical house much favored by Minnesota homeopaths in general was the Duncan Brothers' Homœopathic Pharmacy at 56 State Street in Chicago.

The Minnesota Homœopathic Medical College

The Minnesota Homœopathic Medical College had its genesis in a resolution passed at the old Nicollet House in Minneapolis on February 23, 1886, at a mass meeting of homeopathic physicians:

> Resolved, That a committee be appointed to prepare the Articles of Incorporation of a Homœopathic College of Medicine, select the incorporators, secure their signatures, proceed with all necessary work for the establishment of the journal, and do such other work as would naturally devolve upon the board of trustees, until such board shall be legally formed, when such board shall legally become the successors of the committee.[50]

Members of the committee were the dentist, Dr. A. L. Bausman (1834-1911), chairman, Dr. Otis Milton Humphrey (1832-1911), Dr. John F. Fargo (1835-1911), Dr. William E. Leonard, and Dr. P. M. Hall (1860-1928). Trustees were elected on May 14, and these trustees organized themselves on May 25, 1886, in the Syndicate Block in Minneapolis. The college itself opened on October 4, 1886, at 9 o'clock in the morning, in a building at Fourth Avenue and Twentieth Street in Minneapolis, with Dr. Philo L. Hatch (1823-1904) as dean.[51]

The history of this institution was written by Dr. Eugene L. Mann (1861-1925) who was dean and professor of diseases of the nose and throat in the homeopathic college at the University of Minnesota, and a trustee of the American Institute of Homœopathy. Mann[52] wrote that the college demanded a minimum of two years' study for graduation of a candidate as a Doctor of Medicine, but that three years of study were "earnestly recommended by the faculty."

This college utilized, as might be expected, the resources of the Minneapolis Homœopathic Hospital, and it seems to have been successful, also, in securing access to other Minneapolis hospitals for its students. On April 4, 1887, the college graduated its first class of two homeopathic physicians. In 1887 Dean Hatch removed to California, and Dr. David M. Goodwin (1833-1908), who had been professor of the principles and practice of surgery, was elected Hatch's successor, with the rank of professor of obstetrics. On April 2, 1888, the second class was graduated. It consisted of four candidates. Meanwhile, however, the Board of Regents of the University of Minnesota had decided to establish a medical college* at the university, and since homeopathy was then in a position of

*A medical department had been established at the University of Minnesota in 1883, largely because of the efforts of Dr. Charles N. Hewitt (1836-1910), secretary of the Minnesota State Board of Health and Vital Statistics. No courses were offered. The chief function of the faculty was to examine candidates for the degrees of Bachelor of Medicine and Doctor of Medicine, and for licensure to practice medicine in Minnesota.

comparative power within the state, the Regents had determined to include homeopathic instruction in this medical department. Two chairs were proposed: that of materia medica and that of therapeutics, but the homeopaths were too powerful to be satisfied with these. They demanded and obtained a separate college, unassociated with the "regular" College of Medicine and Surgery of the University of Minnesota. It was known as the University of Minnesota College of Homœopathic Medicine and Surgery. The faculty consisted of these physicians:

Henry W. Brazie (1843-1927)—Secretary, Professor of Pædology
Albert E. Higbee (1842-1924)—Professor of Gynæcology
John F. Beaumont (1855-1927)—Professor of Ophthalmology
H. C. Leonard (1849-1925)—Professor of Obstetrics
George E. Ricker (1854-1905)—Professor of Clinical Medicine
William E. Leonard (1855-1935)—Professor of Materia Medica
Robert D. Matchan (1854-1935)—Professor of Surgery
Warren S. Briggs (1854-1914)—Professor of Clinical Surgery
Salathiel M. Spaulding (1839-1906)—Professor of Nervous Diseases
Henry Hutchinson (1849-1910)—Professor of Practice
Benjamin H. Ogden (1860-1924)—Professor of Diseases of the Skin and Genito-urinary Diseases
Eugene L. Mann (1861-1925)—Professor of Diseases of the Nose and Throat
David A. Strickler (1859-†)—Professor of Otology

At first this college was supervised by the dean of the department of medicine of the University of Minnesota, assisted by the secretary and one faculty member, respectively, from each of the College of Medicine and Surgery, College of Homœopathic Medicine and Surgery, and the College of Dentistry. Later, however, the dean of the department of medicine became dean of the College of Medicine and Surgery, and the secretary of the College of Dentistry and the secretary of the College of Homœopathic Medicine and Surgery became deans of those two colleges. Dr. H. W. Brazie (1843-1927) served as dean of the homeopathic school until 1893, in which year Dr. Alonzo Potter Williamson (1854-1920) became dean. In September, 1902, the college moved to a building on the campus, vacating the building situated at Ninth Avenue South and Sixth Street in Minneapolis which the Board of Regents had rented for it. In 1903 Dr. Williamson resigned as dean to become superintendent of the Southern California Hospital for the Insane, and Dr. Mann became his successor.

The beginning of the end of this college, according to Dr. Mann,[52] occurred in 1903 in an action of the Board of Regents which decreed that prospective entrants of the college must have completed one year of academic college work. In 1906 the Regents further decreed that such an entrant must have completed two years of academic college work before entering the college. This was a disastrous blow, for homeopaths had long insisted that a high school education was sufficient background for any student who wished to enter a homeopathic medical college.* The University of Iowa College of Homeopathic Medicine and the homeopathic schools at Chicago, for instance, had no such requirements as those which the Regents formulated Hence, men who wished to become homeopaths naturally entered the colleges in those two cities, and shunned the

†Dr. Strickler is still living in Denver, Colorado, and has served as secretary of the Colorado State Board of Medical Examiners.

*The University of Minnesota College of Medicine and Surgery in 1888 would admit candidates who had only a high school education; if a candidate did not have such an education he could still gain entry by taking and passing "a very simple entrance examination."

college at the University of Minnesota. "The fall of 1908," Mann[52] declared, "found the college in this unenviable position with a very diminutive student body and no hope of obtaining any favors from the board of regents." With signal energy, the homeopaths invaded in the State Capitol at Saint Paul in January, 1909, and actually obtained from the Legislature an appropriation of $50,000 with which to erect a building on the university campus for the College of Homœopathic Medicine and Surgery. In May, 1909, however, the Board of Regents abolished the college, substituting for it a chair of homeopathic materia medica and a chair of homeopathic therapeutics in the medical department of the university.

As Beard[53] wrote:

> The Board of Regents concluded, in the year 1909, as they might have known long before, that fundamentally there was only one science of medicine; but in order to prove it to the satisfaction of the public, they created two Chairs, the one of homeopathic materia medica, or the study of drugs under different names, and the other of homeopathic therapeutics, or the study of drugs under different doses. The professors in the two Chairs were paid $2,000 each for one year. They earned it. Day by day, throughout that year, they came and sat in those Chairs for the assigned hour, in which no student ever appeared! At the end of the year the Board decided that the Chairs in which homeopathy had sat might as well go, as the College had gone, into the place of Shades.

In 1911 Dr. Henry R. Diessner (1853-1935) of Waconia, a graduate of the Hahnemann Medical College and Hospital of Chicago in 1883, attempted in House File No. 315, "A Bill for an Act to Amend Section 1479 of the Revised Laws of Minnesota 1905, Relating to the Organization of the University of Minnesota and Creating a College or Department of Homeopathic Medicine and Surgery," to revive in some measure the homeopathic tradition at the University, but even though Dr. Diessner was a member of the Legislature, he could not get his bill to pass.[54] The Minnesota Homœopathic Medical College and the University of Minnesota College of Homœopathic Medicine and Surgery were dead and beyond recall.

In 1915 Dr. Beard[55] was able to write:

> There is further evidence of qualitative improvement in the rapid disappearance of sectarian schools. The nondescript pattern has entirely gone. So has the physio-medical type. The eclectics have dropped from ten to four colleges. The homeopaths have but eight schools left out of a maximal twenty-two.
>
> One of the curious things about the present teaching of homeopathy is that sixty-two per cent of its students are taught in New York, Massachusetts and Pennsylvania; thirty-four per cent in three states of the middle west and four per cent in California.

Homeopathic Literature

Minnesota Homœopath.—Armstrong[56] has shown that the *Minnesota Homœopath* was published bi-monthly in Saint Paul by one Dr. George Hadfield in either 1858 or 1859.* The single issue of this journal known to exist is imprinted with the date of January, 1859, and is number 4 of volume 1. This would imply that number 1 of volume 1 had been issued in July of 1858, although it is probably bootless to speculate as to the date of issuance of the first copy of such an ephemeral publication. Armstrong has obtained a picture of Dr. Hadfield, and has set down what is known of his life and career.[56] It would appear that the *Minnesota Homœopath* had a most fleeting existence. Armstrong[56] said that it contained "articles on homeopathy, testi-

*The author wishes to correct an egregious error which he made in an earlier consideration of the *Minnesota Homœopath* (Journal-Lancet, 60:60-67, Feb., 1940). The date of beginning of the *Minnesota Homœopath* should have been 1858 or 1859; in the paper referred to it was wrongly set down as 1854.

monials, and advertisements of Dr. Hadfield's medicines." The little pamphlet is probably Minnesota's first medical journal of any nature.

Transactions of the Minnesota State Homœopathic Institute.—The first bound volume of the *Transactions* was published in Minneapolis in 1882, and had been prepared by a committee consisting of three homeopaths, the chairman of the committee probably being Dr. William E. Leonard (1855-1935). It was printed by A. C. Bausman of Minneapolis, and contained proceedings of the annual sessions of the state body from 1867 to (but not including) 1882, as well as other material. The second volume embraced the years 1882 through 1884; it bore no date or place of issuance, and consisted of bound reprints from the *Medical Counselor* of Chicago. The third volume contained papers and proceedings of meetings of the state society for the years 1885 and 1886, and was styled as a reprint from the *Minnesota Medical Monthly* for April, 1887. The fourth volume was composed of material written and collected in the years 1887, 1888 and 1889. It bore the imprint, "Satterlee, Publisher, Minneapolis, Minn., April, 1891."

Minnesota Medical Monthly.—This homeopathic journal was planned at a mass meeting of homeopaths at the old Nicollet House on February 23, 1886, at which a committee was selected to draw up articles of incorporation for both a homeopathic medical college and a medical journal.[50] Dr. William E. Leonard (1855-1935) was a member of this committee, and the chairman was Dr. A. L. Bausman (1834-1911), a dentist. Other members were Dr. Otis M. Humphrey (1832-1911), Dr. John F. Fargo (1835-1911) and Dr. Pearl M. Hall (1860-1928). Dr. Leonard was appointed to be editor-in-chief of the *Minnesota Medical Monthly,* and his associate editors were Dr. Hall, Dr. Robert D. Matchan (1854-1935) and Dr. Salathiel M. Spaulding (1839-1906). First copy of the new journal bore the date, May, 1886. In this journal Dr. Leonard castigated the "regular" school with robust vigor. In his editorial pages he reprinted paragraphs from other homeopathic journals which heaped scorn on the work of Louis Pasteur (1822-1895), denied the validity of the theory of the bacterial origin of infection, and roundly scolded allopathic attempts at the relief of certain conditions, such as hemorrhoids and malposition of the uterus, by surgical procedures. Last issue of the journal was the one for April of 1888. The *Minnesota Medical Monthly* cost $1.00 a year, or fifteen cents a copy, and was issued by the Homœopathic Publishing Company in the Syndicate Block in Minneapolis.

The Medical Argus.—This journal was established in Kansas City, Missouri, by Frank Fisk Casseday, Ph.B., M.D. (1856-1932). The first issue was the one for July of 1890, and in that issue Dr. Casseday[57] wrote: "During the past few years several attempts have been made to establish a medical journal devoted to homœopathy, in Western Missouri or in eastern Kansas. For one reason or another these efforts have been hitherto unsuccessful.....The ARGUS will be published in the best interests of homœopathy, and our platform will be broad enough so that every department of work in which homœopathic physicians are engaged will receive that attention which it merits." In October of 1890 Dr. Casseday[58] reiterated his intentions: "The ARGUS is for Homœopathy, first, last and all the time, and we believe that we voice the sentiments of the vast majority of homœopathic physicians in the United States when we call for more energetic work in spreading the gospel of Homœopathy among the people." The

journal was moved to Minneapolis in 1891, and the first issue printed in Minneapolis was dated February, 1891. The last issue of the *Medical Argus* was dated January, 1898.

The Minneapolis Homœopathic Magazine.—This journal was subsidized by the Minneapolis Pharmacy Company, 608 Nicollet Avenue, Minneapolis. It was a monthly publication, and sold for $1.00 a year. It was edited by Dr. Henry C. Aldrich (1857-1922), and the associate editors were Dr. John F. Beaumont (1854-1927), Dr. David W. Horning (1852-1917) and Dr. Asa S. Wilcox (1859-1916). First issue of the journal was said by Aldrich[36] to be that for January, 1892. In all, eleven volumes were published. The *Minneapolis Homœopathic Magazine* ceased publication in 1902.

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*References 1-18 appear in the June issue, page 479; 19-37 in the July issue, page 572.

(To be continued in the September issue)

President's Letter

"WHY MEDICAL SOCIETIES?"

THE membership will have an opportunity to attend many local, state and national medical gatherings during the next few months. All meetings to gain our attention must assure three fundamental interests to the attender. First, there must be the scientific program; second, the economic side and discussions; and third, the social contacts. A real meeting to be enjoyed will combine all three in a just proportion.

The scientific portion, to be successful, must be one in which up-to-date scientific endeavor and research are expounded in a language understandable to all, with the knowledge which can be obtained from textbooks eliminated to a great extent, known statistics cut to a minimum, and papers shortened to the time allotted.

The economic side of the practice of medicine should have a very substantial part of the time. Economics and their study in this changing world of medical practice is most necessary if we are going to keep the many types of so-called "state medicine" from fastening their claws in the endeavor now rampant to destroy medical ethics such as we know them. Men with experience and economically minded can well be used on this part of the program. Theory should be eliminated; hard, cold facts discussed.

Social contacts are most necessary and the man or woman who does not come away from a meeting having gained one or more friends has lost a golden opportunity not only to increase his acquaintance but to cement the medical world closer within itself.

The Northern Minnesota Medical Association to be held at Saint Cloud August 15-16 and the Southern Minnesota Medical Association to be held in Mankato September 29 are meetings where home folks meet and get acquainted with each other. They well supplement the meeting of our state association and because of being held in the smaller cities of our state create a greater interest in medicine in the various localities of the state where assembled.

Everyone who can should attend. They will find not only a strong scientific and economic program but an unparalled opportunity for social contacts which we all need to cultivate.

B. J. Branton, M.D., *President*
Minnesota State Medical Association.

Editorial

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BUSINESS MANAGER
J. R. Bruce

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INTERN HEALTH

MUCH of the report of the Council on Medical Education and Hospitals at the recent meeting of the A.M.A. dwelt on the subject of Intern Health. The findings and recommendations of the Council deserve emphasis.

In its survey the Council found that among sixty-one interns who during the period 1937, 1938 and 1939 were compelled to discontinue work because of illness, tuberculosis was the cause in thirty-six (59 per cent).

In 1940 the Council sent questionnaires to more than 5,000 medical graduates of 1937 regarding health during internship. Over half the questionnaires were filled out and returned. From the replies and the records in the A.M.A. files of thirty-four fatalities known to have occurred among the 1937 graduates, it was determined that three diseases were rather outstanding among the great variety of severe and minor illnesses experienced. There had been 142 cases of appendicitis; 103 cases of pneumonia; and forty-eight cases of tuberculosis.

Appendicitis is not preventable but presumably it is promptly recognized and properly treated when it appears among interns. The incidence of pneumonia, which may or may not follow an acute respiratory infection, seems high. The question arises whether acute respiratory infections receive due consideration in the intern population and whether hospitals in general provide the proper mechanism for care of the common cold. The early detection of tuberculosis is essential among interns as well as elsewhere. The recommendation of the Council that chest radiographs of all interns be taken at intervals of three to six months is worthy of adoption. Even more important is the desirability of furnishing healthful recreational facilities for interns in order to prevent the development of this serious infection.

By the time the medical student has reached his internship year he has had several years of close application to his studies. All have not been able to spend summer vacations in the great outdoors, and they should receive more than the casual medical supervision given them in many hospitals.

SMALLPOX AND MINNESOTA

THE distinction that Minnesota had in 1940 of having had more cases of smallpox than any other state in the Union is not enviable. Even the fact that Iowa was a close second with 412 cases compared to Minnesota's 416 does not help.

Smallpox is a preventable disease. While it is not as malignant as it was formerly and can be mild, it can be loathsome.

From 1900 to 1919 there were more than three-quarters of a million cases of smallpox in the

country, with 11,435 deaths. In the next two decades there were nearly 700,000 cases with 5,337 deaths. Seventy-five per cent of those 700,000 cases and 90 per cent of the 5,337 deaths occurred in the decade from 1920 through 1929. During the last decade the incidence and virulence of the disease have been decidedly less. As a matter of fact, last year only 2,839 cases were reported, which is about half those reported in 1934, the previous low record. Nevertheless, several thousand cases of a preventable disease yearly merit some consideration.

Citizens of Minnesota probably do not know that smallpox is practically nonexistent in certain sections of our country. Not a single case was reported last year in the New England and Middle Atlantic states. The West North Central states, which include Minnesota, experienced many more cases than any other group of states.

The reason for the situation lies in the laws adopted by the various states in respect to vaccination. An analysis of the state laws seems to indicate that those states which require vaccination of pupils before they enter school are practically free from smallpox. After such a law has been in effect a few years smallpox ceases to exist. In New York this law applies only to cities of over 50,000 population and yet has apparently resulted in freeing this state of the disease.

In Minnesota the law reads that a child cannot be excluded from a public school because unvaccinated except during a smallpox epidemic. The wording of the law suggests that the legislators considered the right to go to school all important. And yet the law gives the school board the right to exclude an unvaccinated child during an epidemic. From the standpoint of abstract justice, if the legislature can justly exclude an unvaccinated child during an epidemic, why can it not rightly exclude unvaccinated children in order to prevent epidemics?

The prevalence of smallpox is an indication of a state's public health intelligence. Minnesota has been among the leaders in many phases of public health, notably in anti-tuberculosis work and in reducing maternal and infant mortality. There is good reason to believe that a change in our vaccination laws, requiring vaccination before admission to schools, would result, within a few years, in eliminating smallpox from Minnesota just as it has done in the East.

In Memoriam

Kenneth V. Overend

Dr. K. V. Overend, of Hallock, Minnesota, died June 21, 1941, at the age of fifty-four, following a long illness.

Dr. Overend was born August 18, 1886, at Orilla, Ontario. He received his medical degree from Queen's College, Kingston, Ontario. He began practice at Draysota. About 1911 he moved to Hallock where after ton, North Dakota, and later moved to Kennedy, Minnesota. About 1911 be moved to Hallock, where after some years he formed a partnership with Dr. Fred Meyers.

In 1914 Dr. Overend married Grace Mae Fowler of Pembina, North Dakota. He is survived by his wife and four children.

J. A. Slocumb

Dr. J. A. Slocumb, Plainview, Minnesota, died July 3, 1941, following an illness of several years.

Dr. Slocumb was born at Reads, Minnesota, December 19, 1873. A year later the family moved to Winona where he lived until he took up the practice of medicine. The son of a river boat captain, he spent much of his vacations on the river boats.

After graduating from the Winona high school in 1892, Dr. Slocumb studied medicine at the College of Physicians and Surgeons in Chicago, where he received his degree in 1895. After practicing six months at Minneiska, he took over the practice of Dr. Muir at Plainview where he had since practiced.

Much of Dr. Slocumb's practice was in the horse and buggy days before the advent of the automobile and good roads. He served as president of the Wabasha County Medical Society in 1900, 1906 and again in 1919.

As a boy he became an expert cornetist and for many years was an active member of Plainview's band. He served many years on the health board and several terms on the school board. He was one of the promoters of Plainview's first electric light plant, worked to promote the county fair and was always an active participant in the Commercial Club and in other local civic and church affairs.

Dr. Slocumb married Zula Burchard, May 11, 1898. She and two sons, Jesse B. Slocumb, Saint Paul, and Dr. Charles H. Slocumb, Rochester, and one daughter, Mrs. Spencer L. Parker, Minneapolis, survive.

Better dietary habits especially during the past twenty years, have enhanced inborn resistance to all diseases including tuberculosis.—Fred H. Heise, M.D., Amer. Rev. of Tuber., Feb., 1941.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

DOCTOR SHORTAGE

Minnesota had none too many physicians before the national defense effort began.

Now it is clear that there is a definite shortage in medical service. The gaps that have resulted from the departure for active military duty of some 200 reserve and national guard officers have been particularly difficult to bridge in rural districts.

Efforts to find substitutes who could go in to these districts "for the duration" have not often met with success and the result has been, in many instances, that colleagues from neighboring towns have been obliged to take over the medical service for an entire community from more than a commuting distance.

It may be confidently expected that these gaps will become more numerous and the consequent need for adjustments and sacrifices on the part of medical men who remain on the home front will be even greater.

What's at Stake

Civic duty and humanitarian considerations will dictate the extent and character of these adjustments. But all physicians should realize that there is more at stake in this situation than the provision of adequate medical care to the civilian population.

When a rural community is stripped of physicians it means that the nearest doctor may be as much as 20 miles or more away. Good roads and good cars are able to bridge the distance; but the cost of mileage runs up.

The result is that an ordinary home call may cost as much as $10 and more.

For Government Aid

And the result of that is dissatisfaction, resentment and a demand for government relief. The resentment, in all probability, will be directed toward the hard-pressed physician who felt obliged to add necessary mileage costs to his fee. The demand will be for government aid, in the shape of subsidized medical service, for the period of the emergency, an understandable and even logical demand under the circumstances. The trouble is that subsidized service of that kind will have a strong tendency to hold over after the emergency is over and the original practitioners are released from military service.

The situation presents serious difficulties because, after all, transportation costs money and the physician, with every will in the world, cannot be expected to assume the whole burden of it.

Solution

The solution must be found, however, and before—not after—the chorus of complaint arises.

In this, as in many other situations, medical men may well pool their efforts and work together as they have learned to work together in their relations with welfare and relief departments, to provide the essential care.

Physicians Could Get Together

A coöperative plan by which all near-by reputable physicians voluntarily get together to make their services available in rotation in the doctorless community will solve the problem with good will on all sides. The principle of free choice will not be endangered because the entire project will be clearly a temporary accommodation to meet the emergency.

Thus, one of four available physicians might arrange to be present and on call in the community in rotation, each day in the week. He could make all necessary home calls and answer all emergencies. Long and expensive trips for each individual call would then be eliminated.

Would Be Well Received

The plan would be a temporary stop-gap, of course, and recognized as such on all hands. But the good will shown by the physicians in such a

coöperative effort to brige the gap would undoubtedly be thankfully received. Instead of bitter criticism for physicians who found it necessary to charge high mileage costs, there would be good will and gratitude for an arrangement which few, indeed, would resent and nearly all would be glad to accept as part and parcel of the general sacrifice required by national defense.

No Demands

There are a number of communities in Minnesota, now, where coöperative efforts of this sort should, and no doubt will be, considered.

For the doctors who remain at home—and for organized medicine in general, too—it is not enough to plead that they too, are victims of the emergency, and so seek to shift responsibility.

American medicine has been challenged and American physicians are under fire. In spite of current pre-occupations, some government agencies still cast covetous eyes upon services to the sick and there is no doubt whatever that community demands for aid and relief of this character will meet with alert response.

The point is that there must be no demands.

"... THAT THE PEOPLE MAY FIND THE WAY"

George Crownhart, late secretary of the Wisconsin State Medical Society, gave an address before the Health and Accident Underwriters on June 3 in Chicago, three days before his death in Cleveland.

The subject was "Sickness Insurance Abroad." It was much the same address that Mr. Crownhart gave two years ago at a Minnesota County Officers' Conference. But it was given with a challenging awareness of the changes that have taken place in the interval, changes which have brought compulsory sickness insurance closer, not farther away from American life today.

Mr. Crownhart was a careful student and a highly intelligent observer of trends at home as well as abroad. The concluding plea from his last address is interesting and is quoted below especially because of the suggestion that the social ills he had observed in European systems of sickness insurance were comparable in gravity and in their fatal nature to heart disease and cancer.

"I would leave you," said Mr. Crownhart, "with the thought, not that we cannot have compulsory sickness insurance here; or that its closely knit proponents are not making headway to that end. I would leave you with my conviction that such systems have their own diseases that are of such consequence that they can be classed in the same breath with heart disease and cancer; that these, rather than money contributions, constitute the real purchase price for this so-called social legislation.

"In the face of active proposals for the enactment of this legislation in our own country, it is not your duty as well as mine to 'give light that the people may find the way'?"

NEW YORK'S MEDICAL AND WARD CARE SERVICE

A cautious new experiment in a combination of hospital and medical care insurance has been launched in New York City by Associated Hospital Service and a newly organized nonprofit, medical insurance corporation known as Community Medical Care, Inc.

Ward care only, with all necessary medical service in the hospital, will be given under this new plan. Subscribers will be limited to single persons earning $1,200 a year or less, married persons with joint incomes of $1,680 or less for maternal privileges and families with children having incomes of $2,100 or less. Payments will be made by the payroll deduction method and will amount to $12 per year for single individuals and $27 a year for families regardless of the number of children, up to eighteen years of age.

These rates mean that the hospitals are offering the hospitalization part of the contract at a rate well under the 3-cents-a-day rate for two or three bed room service offered regularly by Associated Hospital Service.

Under the new low-cost plan hospital service and medical care will not be offered separately but only under the combined contract.

Patients will have free choice of all participating hospitals and of physicians so long as their physicians are members of the courtesy staffs of the hospitals.

Under the usual order of things medical care for ward patients is given free by house physicians and members of the hospital staff. Receipts for medical services to ward patients earned under this plan will be pooled and divided among all who give the service.

Administrative expenses will be shared equally by the two organizations.

Community Medical Care, Inc., is directed by Dr. I. Ogden Woodruff of New York and six former presidents of county medical societies of Greater New York are said to be on its board of directors. The whole plan has been developed after long study of a variety of proposals by Dr. S. S. Goldwater, president of the hospital organization.

HOSPITAL STRIKES

Two strikes in large eastern hospitals and unrest in many other parts of the country have shown, according to a recent issue of *Hospital Management,* that some effort will have to be made to find a solution other than strikes and violence to difficulties, whether spontaneous or incited, among hospital employes.

At West Pennsylvania Hospital in Pittsburgh, a large voluntary hospital which does a substantial amount of charity work, a strike began last April. It was engineered by CIO Hospital Workers Local No. 255 of the State County and Municipal Workers of America and it was marked by picketing assaults on loyal workers and visitors and other manifestations depressingly familiar in industry. The hospital obtained a restraining order forbidding the Labor Relations Board and the union from attempting any application of the state's labor laws to hospitals. The order was sustained on appeal to the Supreme Court. But the strike is still going on.

In the case of the other strike at the Adelphi, a private proprietary hospital in Brooklyn, the New York State Labor Board held that this hospital was subject to the law requiring employers to recognize and bargain with unions representing their employes. The first court to which the matter was appealed sustained the Board.

It is interesting to note that the leader in the West Pennsylvania strike, John W. Filer by name, was revealed by Columnist Westbrook Pegler to be a criminal of long and varied experience, a convicted robber, deserter from the U. S. Army, automobile thief and highway robber. In 1931 he was convicted of highway robbery and served four years of a five to ten-year sentence in the penitentiary. He was still on parole when, as attendant employed in the city home for the mentally ill, he became president of the CIO local.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Fairmont Physician's License Suspended for Three Years

Re: Revocation of the license of Harry A. Miller, M.D.

On July 11, 1941, the Minnesota State Board of Medical Examiners suspended, for a period of three years, the license to practice medicine held by Harry A. Miller, M.D., of Fairmont, Minnesota. The suspension of Dr. Miller's license is the culmination of an investigation conducted by the Board to determine the circumstances surrounding the rendering of professional services by Dr. Miller to a twenty-four-year-old unmarried patient. The investigation disclosed that the girl went to Dr. Miller for the purpose of terminating her pregnancy and that Dr. Miller packed the uterus and was paid the sum of $50.00 for his services. Several days later a miscarriage took place. The Board could find no justification for Dr. Miller's action.

Dr. Miller was born at LeMars, Iowa, in 1885, and graduated from the Medical School of the University of Minnesota in 1919. He was admitted to practice in Minnesota in 1919 by examination and has practiced at Fairmont since 1928.

Ex-Convict Sentenced to One Year in Minneapolis Workhouse for Violation of Basic Science Law

Re: State of Minnesota vs. Frank J. Brady, alias Frank Bateman.

On July 7, 1941, Frank J. Brady, alias Frank Bateman, fifty-six years of age, who resided at 1400 Yale Place, Minneapolis, entered a plea of guilty in the District Court of Hennepin County to an information charging him with the crime of practicing healing without a basic science certificate, and was sentenced by the Hon. Frank E. Reed, Judge of the District Court, to a term of one year in the Minneapolis Workhouse. Brady was arrested on July 4, 1941, in his apartment while the Minneapolis police were searching for an escaped convict, who was thought to be hiding out at Brady's place. The party for whom the police were searching was not found, but the police discovered a physician's examining table, an electric sterilizer, numerous catheters and medicinal preparations in Brady's apartment. Following a joint investigation of the matter by the Minnesota State Board of Medical Examiners and the Minneapolis Police Department, a complaint was filed against Brady by Mr. Brist on behalf of the Medical Board charging Brady with practicing healing without a basic science certificate.

Brady has two previous convictions for felonies, the first one being for grand larceny in the second degree. Brady, under the name of Frank Bateman, entered a plea of guilty in the District Court of Ramsey County, Minnesota, on October 3, 1922, to an information charging him with the crime of grand larceny in the second degree. That charge grew out of the theft by Brady of a $600.00 Buick touring car. Brady told the Court in 1922 that he was born in Fulton County, Kentucky, in 1885, and that he had been a salesman and also had been in the hotel business. Brady served thirty-one months in the State Prison at Stillwater on that charge. On October 7, 1931, Brady, under the name of Frank Bateman, pleaded guilty in the District Court of Hennepin County, to a charge of manslaughter in the first degree, and was sentenced to ten years in the State Prison at Stillwater. That charge grew out of a criminal abortion performed by Brady on a Minneapolis girl who died on June 5, of that year, Brady's former wife, Isabelle Bateman, also served a term in the Woman's Reformatory at Shakopee, for criminal abortion, having been sentenced on October 30, 1935, to a term of not to exceed four years.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

J. L. McLeod, Grand Rapids, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
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T. G. Clement, Duluth
W. S. Lemon, Rochester
T. A. Lowe, South Saint Paul
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S. E. Sweitzer, Minneapolis
O. H. Wangensteen, Minneapolis
A. E. Wilcox, Minneapolis

NEW DEPARTMENT

A new editorial department takes a bow with this issue of MINNESOTA MEDICINE. By courtesy of the Editorial Committee and with approval of the Council, one page in each issue will henceforth be reserved for publication of practical information to physicians in the field of industrial health.

The importance of this new field was recognized in Minnesota even before the national defense program invested it with a special urgency. It was early in 1940 that Dr. B. S. Adams, as president of the Minnesota State Medical Association, first appointed the committee to work in Minnesota with the newly organized A.M.A. Council on Industrial Health and also with the new industrial program established under the State Department of Health.

Information Needed

With more than $100,000,000 worth of defense contracts now in operation in Minnesota, each of them with a clause for the protection of the health of the worker, the responsibility of the committee for protecting the interests of Minnesota physicians is clear. Furthermore, the need for a means of reaching every physician in the state with regular, up-to-the-minute information about methods of protecting the health of workers is more urgent than ever before.

Basis of Program

Essentially, of course, protective measures introduced in the defense industries are no different from measures which should be in force in all industries, big and small. A good industrial health program is simply good preventive medicine applied to men and women at work. Its basis is two-fold. First, it must study and control working conditions and provide all possible medical and engineering control measures against occupational hazards. Second, it must study the physical condition of the worker with the object, not merely of providing good first aid for injuries, but of keeping the workers physically fit for the job, and of avoiding absenteeism, which is far more expensive in the long run than accidents and compensation. The basis for keeping workers up to par is of course the ethical and comprehensive physical examination with periodic check-up wherever it is indicated. For actual treatment or repair of defects, brought to light as a result of such examinations, the worker is referred to his own physician outside the plant.

The direct result of a well run plant medical service, incidentally, has been shown, over and over again, to be a marked increase in the demand for medical services to the workers made upon physicians of the surrounding community. Generally, the increased demand extends to the worker's family, also, and, all told, the extension of such service is undoubtedly a sound approach to the extension of preventive medicine to the entire American people.

In Future Issues

Future articles under sponsorship of this committee will cover in more detail the actual requirements of modern ethically governed industrial medical departments, including proper physical examinations for workers, proper occupational placement in the plants, depending upon the condition of the worker; rehabilitation and periodic check-ups; the relationship between the plant doctors and other physicians in the community; the function of the public health nurse in industry; the essential function of internists as well as surgeons in the industrial health program. In addition, the work of the newly established Division of Industrial Health of the State Department of Health should be explained in detail, especially the technical medical and engineering advisory assistance provided to industry for the control of occupational health hazards such as dusts, fumes, gases and other toxic materials.

Meeting of April 9, 1941

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 9, 1941. Dinner was served at 7 p.m. and the meeting was called to order at 8:10 p.m. by the president, Dr. John M. Armstrong.

There were fifty-four members and four guests present.

Minutes of the March meeting were read and approved.

There being no further business to come before the society, the scientific program followed.

PROBLEMS ENCOUNTERED IN CARCINOMA OF THE COLON AND RECTUM*

MAX ALBERTS, M.D.

Saint Paul, Minnesota

In considering patients with carcinoma of the large bowel, it is interesting not only to study them from the standpoint of the malignancy itself, but also to consider the general condition and complicating factors that are often present in these individuals. With this thought in mind, we were prompted to make a study of all patients with colonic malignancy who entered the Ancker Hospital, St. Paul, from January 1, 1931 to January 1, 1941; this group comprised 207 patients, 128 males and 79 females, their grouping as to age being shown in Table I.

TABLE I. AGE GROUPS

10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
1	3	11	15	40	73	50	14

Youngest (Male) 18

Oldest (Male) 90 Average 63 plus

The patients seen at the Ancker Hospital, or any comparable hospital, present more problems than those seen in private practice, as will be demonstrated by the analysis of this series. Because few if any surgeons throughout the country have a similar number of this type of case in private practice, comparable statistics are rare although Lockhart Mummery's figures show that in cases of carcinoma of the rectum his mortality was 3% as against 14% in the cases he handled in a charity ward.

A careful review of the histories of this group of patients reveals that there were only seventeen who had no other demonstrable disease. The largest group, which numbered seventy-nine, were those suffering from various forms of cardiovascular disease, hypertension and associated arteriosclerosis. These patients were all individuals who had been and were at the present time under the care of physicians for some condition falling in this classification. No individual was classified as having a hypertension unless the blood pressure was over 185 systolic, and not a few were decompensated on admission. Forty-one patients came into the classification of those having some condition pertaining to the genito-urinary system, the most common condition being hypertrophied prostate, with associated cystitis and pyelonephritis. Nine patients were definitely psychopathic, which naturally made the finding of colonic malignancy often an accidental one. Syphilis, acute cholecystitis, fibroid (large and multiple), pregnancy, tuberculosis, diabetes, primary anemia, incarcerated hernia and pneumonia were other conditions adding to the problem.

Considerable thought had to be given to individual cases as to just when and how the various conditions present should be handled. One woman in this group entering with a carcinoma of the recto-sigmoid developed an acute cholecystis with jaundice and it was necessary to perform a cholecystectomy before the lesion in the bowel could be operated upon. In the case of a complicating pregnancy, it was advised after consultation that the uterus should be emptied before resection be attempted. This was done. However, in this particular case numerous metastases were found throughout the peritoneal cavity upon exploration. In dealing with another individual in this group, it was necessary to operate for an incarcerated hernia. In another case a subtotal hysterectomy for large and multiple fibroids was done because of repeated severe uterine hemorrhages. Two of the patients in this group were admitted to the hospital with bronchopneumonia, and it was only in doing a complete physical examination that a lesion pertaining to the large bowel was demonstrated. Thus both individuals were subjected to resections a short time after a severe pneumonia. In the cases presenting diabetes, primary anemia and tuberculosis, close coöperation between the internist and the surgeon was adhered to at all times with the thought in mind of having the patient in the best possible condition before such major operation was attempted.

A goodly number of individuals entering the hospital had obvious metastases which could be readily demonstrated on initial examination, and although these patients should probably not be placed in this group, nevertheless it was the most hopeless group that was assigned to the surgical service. Twenty-five patients did not apply for admittance to the hospital until a rather complete obstruction manifested itself, and obviously these patients presented a more or less desperate picture as all similar obstructions do.

Symptomatology

Practically the entire group of patients presented the classical symptoms that have so often been described

*Inaugural Thesis.

in conjunction with malignancies of the large bowel, but I believe it is worth-while to briefly restate the cardinal complaints taken from the history.

The average duration of symptoms in this particular group was approximately nine months, the shortest being five days, the longest giving a typical history relating to a lesion of the large bowel for five years. One hundred sixty-five of these patients gave a definite history of change in bowel habits. Of this number sixty-eight complained entirely of constipation, forty-two reported periods of diarrhea, while fifty-five complained of alternating diarrhea and constipation. Due to certain factors such as being unable to speak English or being too weak to give an accurate history, we were unable to obtain a history pertaining to this phase from seven patients, leaving a remainder of thirty-five patients who apparently had had no change in this respect. Thus we see that approximately 80% had a positive response as to change in bowel habit.

Seventy per cent of this group reported weight loss, the average of the entire group showing a sixteen pound loss since the onset of the symptoms. It must be said that this figure cannot be taken with too great a reliability as a number of the patients estimated the amount lost.

Another interesting phase in the symptomatology was the question of pain, and contrary to Rankin's report it was surprising to note that 172 of these patients had a definite complaint of pain varying in the time of onset. Twenty-eight of the group stated that they never had any pain whatsoever, and as listed before, seven were unable to give an adequate history. This pain varied in character but can briefly be divided into two groups: (1) those who complained of dull aching pain or a sensation of fullness in the rectum; and (2) those who complained of abdominal distress. In the latter group this pain too was often difficult for the patient to describe, ranging from periods of mild distress to hard and severe colicky pains. Patients noting blood in their stools numbered 113, fourteen were questionable, and eighty of these individuals had never noticed anything resembling blood in the stools. A history of emesis was reported by fifty-one patients in this series. True also was the fact that of the twenty-five who entered the hospital acutely obstructed and naturally vomiting, fifteen had never had emesis until the obstruction had become quite completed, while seven patients reported the vomiting always accompanied their so-called attacks of pain.

Laboratory Data

With the exception of the cases of carcinoma of the rectum and lower rectosigmoid, the diagnosis of course was confirmed by roentgenological examination. Routine proctoscopic examination was carried out in all lower bowel lesions and often tissue for microscopic study was obtained.

It was noted that the average hemoglobin was 51 per cent, the lowest being 16 per cent, the highest 94 per cent, with a corresponding fluctuation in the erythrocyte count. A study of the anemia produced in carcinoma of the large bowel, particularly those involving the right colon, has been extremely interesting and various theories have been advocated in trying to explain this more or less constant finding. Alvarez, Judd, MacCarty and co-workers gave careful study to this problem some years ago, but the probability is that slow oozing from the new growth is the primary factor in producing this more or less constant blood picture of secondary anemia. Our findings of more severe anemia in lesions of the right colon are in agreement with those of similar groups reported.

Perforations

Perforations were noted in twenty-four of this series of cases. However, on further analysis we find that the terms perforation and fistulous opening were used somewhat interchangeably especially in lesions of the rectum and rectosigmoid, eight of the patients with primary lesions in these locations having had fistulous openings between the bowel and the vagina or bladder. This group therefore includes not only true perforations, but the resultant picture caused from destruction by the invading malignancy.

The sites of the other described perforations were divided as follows: sigmoid six, cecum seven, splenic flexure one, ascending colon one, descending colon one. Various opinions have been expressed as to the direct cause of perforation in the presence of colonic malignancy, that is, whether said perforations are due to a breaking through of the new growth, a spontaneous rupture because of the inflammatory process almost always accompanying such conditions, or an associated diverticulitis.

Just how such a condition must be dealt with varies with different individuals. Nevertheless, resection should never be carried out immediately in the face of such a finding. The cases in this group were handled usually by draining the abscess after it had completely walled off, and occasionally supplementing this procedure with a colostomy some distance from the pathological process. Some surgeons prefer, where it is possible, to do a short-circuiting type of operation in such a case rather than a colostomy. Colostomy is always indicated where the vagina or bladder has been invaded, solely because of the comfort it affords these unfortunate individuals. In by far the greater percentage of cases presenting such a complication, the diagnosis is readily made, with findings familiar to all. Dixon and Weber have brought out the fact that a perforating lesion can sometimes be diagnosed by the saw-tooth type of temperature that is produced following the administration of vaccine, this type of temperature usually lasting from five to six days in contrast to the forty-eight-hour rise usually encountered.

Operations Elsewhere

A number of the patients with carcinoma of the colon had had various types of treatment and surgical procedures prior to entering the Ancker Hospital, and this group is classified as follows:

Eleven patients had had exploratory operations else-

where, at which time multiple metastases had been found and colostomy performed. Five who had had completed operations, four for carcinoma of the rectum and one for carcinoma located at the hepatic flexure, the average time since operation having been two and one-half years, were now admitted because of mestasis. Two patients had had first stage operations elsewhere, the first having been for drainage of an abscess as a result of perforating carcinoma of the cecum, which was later resected at the Ancker Hospital; while the second had had a colostomy elsewhere, and was then sent to the Ancker Hospital where a posterior resection was carried out for carcinoma of the rectosigmoid. Four individuals in this particular group had had radium treatments for carcinoma of the rectum—seven, nine, twenty-four and twenty-nine months prior to admission. One patient had had a combination of fulguration and radium, and a second had had fulguration treatment for carcinoma of the rectum two years before. It was necessary that a colostomy be done on these two patients due to the resulting stricture which previous treatment had produced.

One can readily see that by far the greater percentage of this group of patients came to the hospital in a more or less hopeless state and because of the fact that proper care could not be given them in their own homes.

The reluctance of individuals to accept surgical procedures when this condition is originally diagnosed is illustrated by the three individuals in this group entering the hospital with obvious metastases who had been diagnosed one and a half, two years and thirteen months previously, and had refused operation elsewhere at that time. Six patients seen relatively early at the Ancker Hospital refused to submit to any operative procedure although one in this group refused a posterior resection after colostomy had been made.

Failure to accept early prescribed treatment as was encountered here is one of the chief factors in elevating the mortality statistics in colonic malignancy.

Metastasis

In dealing with carcinoma of the large bowel, as with malignant lesions elsewhere in the body, the bugbear always before us is the question of metastasis, a question which with our present knowledge is not completely understood and the presence or extent of which cannot be accurately determined pre-operatively.

Pathologists seem in agreement that malignant lesions spread either by direct extension, through the lymphatics, or by the blood stream, particularly through the venous system.

In studying the various sites of metastasis in this particular group of cases, our conclusions and findings correspond to similar studies by other men and clinics. In this group of cases by far the most frequent site of metastasis was to the liver and to the immediately surrounding lymph-nodes, but there does not seem to be any part of the body where the secondary lesion may not manifest itself unless it be in the skeletal parts of the body. Thus we find in this particular group that in addition to metastasis to the liver and regional nodes, the pancreas, peritoneum, kidneys, bladder, vagina, pleura, lungs and even the brain may become secondarily involved.

A case in particular, falling in the last group, was that of a colored woman, aged forty-nine, who presented herself at the hospital in a stuporous condition with a rather indefinite history of having fallen. Because of the physical findings it was thought that she was suffering with a lesion of the brain, such as a subdural hemorrhage or tumor, and that exploration was advisable. Decompression was carried out, a tumor was found, and postmortem a few days later showed the lesion in the brain to be a metastatic carcinoma from a primary lesion in the sigmoid, and save for the fact that there were a few carcinomatous glands in the immediate area about the sigmoid, no other metastatic involvement could be proven.

Two other cases were noted in this group with physical findings essentially negative, outside of those pertaining to a carcinoma in the large bowel itself, with the exception that both had a marked hypotension, having approximately a systolic blood pressure of 80 and a diastolic varying from 30 to 40. One of these individuals was quite certain that his blood pressure taken a year before was in the neighborhood of 135 systolic, while the other was unable to give us any data as to previous blood pressure readings. Both of these patients were explored and because of demonstrable metastasis in the peritoneal cavity no further operative procedure was carried out. Postmortem examination within two weeks revealed marked involvement of the adrenal glands. Should a future finding such as marked hypotension make us suspicious of suprarenal involvement?

Size of the original lesion and duration of symptoms cannot be taken as a guide in predetermining the amount of secondary involvement to be encountered. I believe that every physician has had patients under his care with symptoms of extremely short duration and an extremely small primary lesion to all intents and purposes extremely amenable to surgery, only to find at operation extensive metastases throughout the peritoneal cavity and possibly to other parts of the body. I believe that it is an accepted fact that carcinoma of the rectum is prone to metastasize much faster than lesions in other parts of the large bowel.

How accurate are the findings on exploration with respect to metastatic lesions is a question that has always given me considerable concern. Involvement of the regional glands and of the liver can usually be satisfactorily demonstrated by the surgeon at the time of exploration. Nevertheless one occasionally finds what he may think to be a perfectly operable lesion, where he is unable to demonstrate secondary involvement, and yet metastasis has manifested itself in some locality which the exploring hand has been unable to demonstrate. A case in our group demonstrates this point very well, where a carcinoma of the rectosigmoid was explored, resection carried out, with postmortem findings one week later showing no evi-

dence of metastasis in the peritoneal cavity and yet the pleura showed considerable involvement.

Cases such as this will readily demonstrate the difficulty of arriving at an accurate conclusion as to the presence or absence of secondary involvement. I have discussed this phase with various members of the profession and in their opinion the percentage of accuracy varies from 50 to 90 per cent. The most accurate work done on this problem I believe was recently carried out by Dr. C. W. Mayo in which he carefully reviewed the postmortem findings in some 160 cases, all of the deaths having occurred not more than three weeks after exploration. By comparing the findings of the surgeon, as reported by him immediately after his surgical procedure had been carried out, with the findings of the pathologist, it was shown that the surgeon had approximately 17 per cent chance of being wrong. This, in my opinion, is an exceptionally gratifying percentage, as I believe that all men having considerable experience in this field will agree.

It is pertinent, I believe, to briefly discuss the operative procedures that should be employed in the face of secondary involvement, particularly to the regional lymph-nodes. Some years ago Bloodgood advocated the resection of the involved portion of the colon even in the face of secondary involvement. His logic for advancing such an idea was that in the first place one could not be definitely sure whether or not the nodes involved were cancerous in character or merely inflammatory; and secondly that resection in the face of metastasis gives the individual considerable more comfort than any of the short-circuiting procedures so often resorted to. I have had one experience in this respect where, on exploring a patient with carcinoma of the ascending colon, numerous nodes were found which at that time led me to believe that the resection of that portion of the colon was inadvisable. I removed several of the nodes for microscopic study and then made an ileocolostomy. It was a considerable surprise when the pathologist reported that there was no evidence of malignant involvement of the nodes removed. This patient refused further operation and although she was lost track of I believe that had I followed Bloodgood's advice an excellent result could have been obtained. Resection is very often more easily performed than various anastomotic or short-circuiting procedures, and it has been shown by Mayo that while there is a slight increase in the mortality rate where resection is performed, nevertheless, there is a definite prolongation of life, with considerably mor comfort to the patient. The theory that removal of the primary lesion causes a slowing or even a temporary regression of the metastatic process seems to have considerable support.

Treatment

Before discussing the types of operations used in this series of cases, I would like to briefly review the history pertaining to large bowel surgery.

Littre, in 1710, after observing the death of an infant with an imperforate anus, was the first, I believe, to suggest colostomy. Pillore, in 1776, was the first to successfully do a cecostomy, and Dubois, in 1783, performed the first iliac colostomy. The left iliac colostomy was first done in 1793 by Duret, the indication being an imperforate anus, and Baudens in 1842 improved on Duret's colostomy, and it was this modification which is so universally used today. The English claim that Paul of Liverpool, in 1892, was the first to do what is now known as the Mickulicz type of operation for carcinoma of the colon. However, it has been said that Maydl had performed similar operations thirty years before with Block, Volkman and others practicing this procedure well ahead of Paul. Schede, in 1879, made the first double barrel colostomy on an occasion when he was unable to anastomose the bowel after resection. In 1885, Kraske performed the first resection of the anus and rectum. While Block of Copenhagen, in 1892, was the first to exteriorize the tumor and bowel without resection, it was Mickulicz beginning in 1902 who made this procedure so popular.

Of course other men aided immeasurably in the advances in large bowel surgery, notably Billroth and Halstead with their work on intestinal anastomosis, and Dr. William Mayo who contributed so much to this field particularly to lesions involving the right colon.

The site of the primary lesions in our group of cases is shown in Table II.

TABLE II

Rectum	Rectosigmoid Sigmoid Descending Colon	Transverse Colon	Cecum Ascending Colon Hepatic Flexure
94	67	4	42

The operative procedures in our series of course depended on the type of lesion, condition of the patient, and the particular surgeon handling the case. A list of the types of procedure is shown in Table III.

TABLE III

Colostomy—Post Resection	22
Colostomy—Resection of Sigmoid	14
Mickulicz—Sigmoid	3
Combined—Abdominal Perineal Resection	4
Resection of Cecum	6
(a) Primary	4
(b) Two stage operations	2
Colostomy—Resection of Transverse Colon	2
Ileocolostomy—Resection of Ascending Colon	1
Ileocolostomy	2
Fulguration	2
Decompression—Carcinoma of Sigmoid	1

It was interesting to note that of all the patients treated in this group, only four were found suitable, that is, in condition to withstand a one stage combined abdominal perineal resection. In a number of these patients with the lesion involving the left colon, preliminary colostomy was carried out followed by daily irrigations with the purpose of not only cleansing the bowel but giving the inflammatory process a chance to subside before resection was attempted. I realize that this is a debatable procedure in that certain men of

experience claim that cecostomy does not allow complete emptying of the fecal stream and that the bowel cannot be cleaned to any great extent despite the technique employed and the amount of fluid used in the irrigation. Personally I have never adopted this procedure, but I have had the opportunity of seeing a number of cases where this technique was followed and I can vouch for the excellent results which were obtained.

In addition to the list presented in Table III, thirty additional patients underwent exploratory operations where numerous metastases were found, and colostomy was performed, due to the already present or anticipated obstructive symptoms.

Those patients entering the hospital acutely obstructed, of course, presented the most difficult problem, and the relief of the obstruction was of the prime importance at the moment. Nasal suction was instituted immediately, but this procedure alone was only completely satisfactory in five cases, the remaining twenty of this group having to have some form of colostomy. Not only in the acutely obstructed group but in the majority of the cases dehydration had to be corrected and transfusions were used in practically 80 per cent of the cases.

In the past few years it has been found in general that some type of spinal anesthesia is the anesthetic of choice in dealing with this type of case. This type of anesthetic has been used practically routinely in the handling of these cases.

Thus, in the accounting of 207 cases studied, we find that six patients entered the hospital with a carcinoma of the large bowel, in so extreme a condition due to some illness not associated with the intestinal tract, such as cardiovascular disease, pneumonia, uremia, etc, that they expired within thirty-six hours after admittance. No operative relief could be attempted in this small group despite Finsterer's statement that "no patient with carcinoma of the bowel is too old or too weak to be operated upon."

Three patients died in the hospital of other causes and carcinoma of the colon was found at postmortem examination.

Of the total group 106 entered the hospital with obvious metastases, many having undergone operations at some other hospital or at the Ancker Hospital at some previous date.

Five of the group refused operation, and an additional one allowed a colostomy but refused posterior resection.

This leaves eighty-six patients thought suitable for surgery. Fulguration treatments were given to two patients with carcinomatous lesions located in the rectum, because of the advanced age of the patient.

The mortality varies considerably in reports published dealing with this particular subject, ranging from 10 to 63 percent. With such variance it is obvious that a difference of opinion exists as to just what should constitute operative mortality, that is, with particular reference to the time limit after operation.

In the eighty-six patients operated upon at the Ancker Hospital, we had a mortality of slightly in excess of 17 per cent and these figures were based on the fact that the patient had apparently recovered from the operation and death had not occurred within three weeks after the operative procedure was completed.

In reviewing the postmortem findings, we find that peritonitis was still the largest individual factor in causing mortality, which I believe is the general experience elsewhere. None of the patients in this group had been given any form of immunizing agent or vaccine, so I am not prepared from personal experience to discuss this particular subject. Mayo, Dixon, Coller and Fansler believe that it has a definite place in the armamentarium of those doing this type of work, Dixon believing that there has been a thirty-six per cent decrease of peritonitis in his series since using a vaccine, while Mayo believes that it is a responsible factor of safety in about 1.5 per cent of cases. Rankin and others apparently have little or no faith in this pre-operative vaccination. Granting that the use of this vaccine has a definite place, I still believe that probably the largest percentage of peritonitis is due to faulty technique.

Although the number of cases was small, it was striking to note that the death rate following colostomy as a palliative measure was five to one over colostomy which was followed by further operation. This too seems to be a rather constant finding as reported in the literature. Two of the deaths which followed colostomy in our group were the result of small bowel obstruction, the bowel having become wedged between the proximal portion of the bowel forming the colostomy and the parietal peritoneum. As a result of this finding I have always attempted to place one or two interrupted stitches between this part of the bowel and the peritoneum so that the small bowel cannot work its way into this area and thus become obstructed.

The remaining causes of death in this group were embolism, hemorrhage, bronchopneumonia, and gas bacillus infection which followed the drainage of an abscess about the cecum due to a perforating carcinoma.

Conclusions

It is quite obvious that the type of patient with carcinoma of the large bowel seen in a hospital such as the Ancker presents many more problems than those seen in private practice, for reasons I believe that are readily understandable.

While we are extremely interested in lowering the mortality statistics for any type of surgical procedure, I believe that the mortality rate from the Ancker Hospital is comparable to that of other similar clinics and it is gratifying to report that none of the patients with carcinoma of the rectum had ever been operated upon for hemorrhoids.

As regards the problem of metastasis and the recognition of such, there must naturally be an error in the failure to recognize such in a certain percentage of cases.

It was Bloodgood who said that it was the failure of the patient himself to consult medical advice when symptoms first presented themselves which still leaves so much to be desired in the satisfactory outcome of these cases, and not the failure of the examining physician to recognize the condition.

According to Lord Moynihan, "few places in the body

affected by carcinoma are so accessible and safe to curative operations, yet the relative good prognosis in carcinoma of the colon is dependent on several factors." It is some of these factors that we have endeavored to bring out in this review.

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Discussion

Dr. E. M. Jones, Saint Paul: I am very much interested in Dr. Alberts' review of the cases of carcinoma of the large bowel at the Ancker Hospital. I think it is pretty generally agreed that the cases of carcinoma of the large bowel are classified as bad risk cases and require our utmost attention to preoperative preparation and postoperative care, in order to keep down the mortality and morbidity rates.

There is one type of case in this group that has been a problem to me. It is the instance in which there is a lesion of the sigmoid and it is difficult to differentiate between a carcinomatous lesion and diverticulitis. I recall one man who came in to see me forty-eight hours after the onset of his illness. He had a temperature of 101°, with a history that he had passed a little blood by stool and he had very marked tenderness and some muscular spasm in the lower right quadrant of the abdomen. My first impression was that he had a sigmoiditis or diverticulitis. He was hospitalized and after a few days a proctoscopic examination was made, which was negative. The roentgenologist reported a lesion in the lower sigmoid which might be due to diverticulitis. This man was advised to have an operation, but he felt so well in 10 days that he insisted on going home. When I saw him at my office a week later he refused further investigation and returned to work. I did not hear from this man for a year, and at that time I found that he had had no further medical attention until he became obstructed. Exploration was carried out and an inoperable tumor was found.

We have a seventy-seven year-old man in the hospital at the present time who presented very much the same problem. However, an exploration was done and he was found to have a carcinoma. A resection was carried out and his progress has been very satisfactory.

The point I wish to emphasize is that these patients should be explored and the final treatment of the lesion be left to the discretion of the individual surgeon.

Dr. Harold Hullsiek, Saint Paul: I should like to compliment Dr. Alberts on his work. An analysis and review of any subject always leaves one with the impression that he has done no original or creative work. A statistical review is important in that it permits reasonably safe generalizations. I think this is a very creditable *arbeit.*

Dr. Alberts made little mention of complications. I wonder if these cases were studied with reference to ensuing bladder disturbances. It seems to me that this complication has not been sufficiently stressed in discussions of this subject.

I have had several distressing experiences with prolonged supression of urine following posterior resections and I should like to ask him what proportion of bladder function resulted in this series of cases.

Dr. Arnold Schwyzer, Saint Paul: I think the picture Dr. Alberts has developed is a very interesting one showing the unfavorable conditions that the surgeon is liable to find in such a community hospital. He sees so many complications, so many coincident troubles, especially in older people. The material is of necessity much worse than the one a surgeon encounters in his private practice. It is interesting to hear of all these complications and difficulties.

Dr. Alberts mentioned a carcinoma of the colon where many glands were enlarged, and he made only a decompression operation. Afterward it was found these glands were not malignant but inflammatory. This is not an infrequent finding. If a colostomy is to be made, the Devine method (where the gut is divided and the two ends are brought out through two separate openings) is at times too much of an operation. I have seen very solidly fixed carcinoma of the sigmoid become quite movable after a preliminary colostomy and cleansing of the gut. What seemed carcinomatous fixation was only inflammatory infiltration. A simple colostomy relieves the pressure and the gut can be cleansed. It is not of importance to disinfect that gut elaborately. The main thing is the relief from the severe peristaltic cramps and the enormous pressure in there. It is from this gut that one gets absorption and inflammation. I have repeatedly made only an ordinary colostomy and washed out the gut, not with any idea of sterilizing the gut thoroughly, and have seen the immobility disappear.

As to metastases, I remember very important pathologic findings that came out of the University of Heidelberg a good number of years ago. The publication was by Colmers and Peterson who worked under Czerny. They had made exact microscopic studies in patients who died of carcinoma of the rectum at the Clinic. It is well known in carcinoma of the rectum that you do not have lung metastases except at a very late stage. You get metastases other places, but not in the lung. All these cases were operable cases and in all they found single-cell carcinoma emboli in the lungs.

(Continued on Page 692)

TRANSACTIONS OF THE MINNEAPOLIS SURGICAL SOCIETY
Stated Meeting, Thursday, April 3, 1941

President JAMES A. JOHNSON, M.D., in the Chair

Secretary, R. F. McGANDY, M.D.

CONGENITAL HYPERTROPHIC PYLORIC STENOSIS

Report of Two Cases in Sisters

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By congenital hypertrophic pyloric stenosis I refer to that definite clinical entity in which there is always an increased thickness of the pyloric sphincter with symptoms appearing in the first few weeks of life.

The first case was reported by George Armstrong in 1777, but until 1898 only seventeen undoubted cases had been reported. In 1841 Williamson of London reported another case. The true pathology, up to that time, was not known. Landerer reported another case in 1879 and for the first time the name, congenital pyloric stenosis, was applied to the condition. In 1887 Hirschsprung initiated our modern interest in the disease in infancy. In 1896 Finkelstein first described the palpable tumor in the epigastrium associated with the symptoms that had previously been described. The type of vomiting was also characterized then—projectile.

The condition today is quite commonly recognized and it is estimated that one in four hundred male infants are affected. The condition is found seven times more frequently in male babies than in female. After an exhaustive review of the literature, we have failed to find anywhere a report of two girls in the same family being affected, with one exception, that of twin girls reported by Thompson and Gainsford in the *British Medical Journal* in 1935.

Twenty men have reported two or more male members of a family having had this condition, several of them being in male twins.

An instance of hypertrophic pyloric stenosis affecting female siblings was encountered in our practice. A review of the literature of reported cases of the condition in siblings, with particular reference to the sex of the individuals, has been made. One instance has been found in which the condition affected sisters, and these were twins.

Numerous authors have noted familial occurrence of hypertrophic pyloric stenosis. Several observers, including Sheldon, Caulfield, and Thompson and Gainsford, have observed the condition in relatives other than siblings. Huebner, Svensgaard, Still and others have noted cases in siblings, but sex is not mentioned.

Unexplained features are the great muscular hypertrophy, the phenomenon of occasional cure without surgery, the prevalence in male children, the frequency with which it occurs in the first child of the family, and the disappearance of the tumor after the Fredet-Rammstedt operation.

Although we have no proof that the hypertrophy is congenital, most authorities agree that a condition which almost invariably makes its appearance within the first three weeks of life and not infrequently in premature infants, in twins, or in several members of the family, must be congenital. Furthermore, it does not seem possible that the degree of hypertrophy could result in the first few weeks of life.

The clinical picture of this condition is usually as follows: the baby appears perfectly normal at birth, nurses well, and for the first week or two gains in weight. Then, without any known cause, the child starts to vomit occasionally. As time goes on, the vomiting becomes more frequent anl becomes projectile in type. The child's appetite usually remains good and he usually takes the proper amount of food. As the vomiting continues, the child commences to lose in weight, the bowels become constipated, and the urinary output is scant. Visible peristalsis appears in the epigastrium, the waves starting on the left hand side and progressing downward and to the right. As the condition progresses, these peristaltic waves become more visible, especially if the patient loses weight and becomes emaciated. Occasionally the symptoms will rather suddenly disappear and the patient appears apparently normal again, only to have a recurrence of the symptoms a few days later. The vomiting may appear during or immediately after a feeding, and may be greater in amount than the amount of food taken at the preceding feeding. The vomitus is usually free from bile.

Visible gastric peristalsis is considered to be a cardinal symptom. In most cases a palpable tumor-like mass can be felt in the epigastrium, slightly to the right of the midline. This mass is most easily palpated in extremely emaciated infants, in severe cases during the time that peristaltic waves are visible or shortly after projectile vomiting. A definite variation in the hardness can frequently be tested in the mild cases or during convalescence.

While very early diagnosis may be difficult, it is usually not difficult if vomiting has persisted for more than a week. An accurate history and a close inspection of the abdomen for the visible peristaltic waves and palpation of the tumor in the epigastrium help in making the diagnosis. It is quite certain that hypertrophic pyloric stenosis exists if the type of vomiting is projectile, if the vomiting appears in the first three weeks of life, if the vomitus is free from bile, if there is a continuous weight loss, a palpable tumor in the epigastrium, visible peristaltic waves, and if constipation and oliguria are present. This chain of symptoms and findings of these physical signs should lead the diagnostician to make a fluoroscopic examination of the stomach. While the x-ray is used in making the

diagnosis in most of these cases, it is not absolutely essential in a large majority of cases.

The development of the modern operation for this condition is interesting. Jejunostomy was the first operation proposed and performed. Following, a pylorectomy was done. Following that, gastro-enterostomy and pyloroplasty. The first successful gastro-enterostomy was performed in 1898. The procedure became the operation of choice and remained so for fifteen years. The first pyloroplasty of the Heineke-Mikulicz type was performed in 1900. This operation involved a complete pylorotomy, cutting through the mucosa as well as the other tissues. Soon after that, a V-shaped submucous pyloroplasty was advised and successfully done. In 1907 Fredet performed successfully a submucous pyloroplasty by means of a straight incision over the anterior part of the pylorus extending through the serosa and the muscular layer but not through the mucosa. This longitudinal incision was then transformed into a transverse wound by the use of sutures put in parallel to the long axis of the bowel. In 1912 Rammstedt performed an operation similar to that of Fredet, but omitted the transverse suture, leaving the pyloric wound open. The operation done by most surgeons today is a modification of Fredet's and Rammstedt's operations and is known by their names. There are modifications of this operation described and done, notedly by Straus of Chicago, who utilizes a flap to cover the exposed mucosa. An important feature of the operation is the separation of the mucosa from the muscular layer the whole circumference of the bowel.

Most surgeons now operate on all cases except in rare instances where the symptoms are mild and the infant is 2.5 or 3 months old. The duration of the symptoms and the amount of weight loss are perhaps the most important factors in determining the prognosis.

Pre-operative treatment is the principal factor in determining the surgical mortality rate. Essential points in that treatment are restoration of fluids and chlorides by subcutaneous injection and administration of glucose in water by mouth as a substitute for milk in most cases. The effect of the treatment is startling many times. When weight approaches normal (which is usually in 2 or 3 days), surgery should be resorted to under drop ether anesthesia.

Operation

An incision about 4 cm. is made through the right rectus muscle beginning just below and 1.5 cm. to the right of the xiphoid cartilage. This places it over the right lobe of the liver, necessitating a retraction of the lobe and reduces the possibility of postoperative herniation. The tumor mass can easily be felt and elevated between the thumb and index finger of the left hand. An incision is made through the superficial portion of the mass and the muscle fibers further separated by means of mosquito forceps until the mucous membranes of the stomach fills the wound. Great care is required in the duodenal portion as the circular muscle extends into the duodenum much like the cervix projects into the vagina, and, unless care is taken, the mucosa of the duodenum is easily opened. If this opening occurs and is unrecognized, there is the danger of postoperative peritonitis. Bleeding is usually minor and no ligatures are generally required. The wound is closed by continuous chromic catgut, size 00, in the peritoneum and anterior rectus sheath. Hypodermoclysis (80 to 100 c.c.) is given daily for three days and all food given with medicine dropper. A few ounces of 50 per cent breast milk are given four hours after the operation and gradually increased. If the baby is nursing, it can be put to breast on the fourth or fifth day.

The cases I report tonight are unusual in that they were sisters born three years apart but each developed its symptoms a few weeks after birth.

Case 1.—J. H.,* female, five weeks of age, was admitted to the hospital on December 1, 1934, with a history of loss of weight, vomiting, and diarrhea of four days' duration. Birth weight was 3.543 kilograms (7 pounds 13 ounces), and she had gained weight and been entirely well until November 27, 1934, when vomiting began which was described as projectile. At first, water was retained; a few days after onset, nothing was retained.

The physical findings on admission were: weight 4.004 kilograms (8 pounds 13¼ ounces); temperature 100°; evidence of dehydration; decreased turgor of the skin; and excoriation of the skin of the buttocks.

Proctoclysis, thickened-cereal-breast-milk formula, and atropine were given. Vomiting continued on this régime. A gastro-intestinal study on December 10, 1934, revealed almost complete gastric retention at two hours, 90 per cent after four hours, and 80 per cent at six hours. Since admission the weight had dropped to 3.926 kilograms (8 pounds 10½ ounces).

On operation December 11, 1934, a thickened fibrous pylorus was found which was incised by the Fredet-Rammstedt method.

Intermittent vomiting continued postoperatively and ceased on the seventh postoperative day. The patient gained weight steadily and was discharged on the ninth postoperative day, weighing 4.070 kilograms (8 pounds 15⅝ ounces).

She is now a healthy girl of six and a half years.

Case 2.—N. H., a female, seven weeks of age, sister of the above patient, was admitted to the hospital on January 19, 1938, with a history of vomiting of ten days' duration and loss of weight of three days' duration. The birth weight was 3.742 kilograms (8 pounds 4 ounces) and weight gain had been progressive to three days before admission when it was 5.338 kilograms (11 pounds 12⅜ ounces).

Physical examination showed a weight of 5.025 kilograms (11 pounds 1¼ ounces); temperature 99.6°. There were visible peristaltic waves extending from the left upper quadrant to the right lower quadrant. Urine examination was negative. Bleeding and clotting time were normal.

Thickened cereal feedings and Hartmann's solution subcutaneously were given. Vomiting continued and the weight dropped to 4.850 kilograms (10 pounds 11 ounces).

X-ray study on January 21, 1938, showed a dilated and atonic stomach with almost complete retention at two hours. 70 per cent at four hours, and 50 per cent at six hours.

At operation on January 22, 1938, a whitish, thickened pylorus 1.5 inches long and 0.5 inch in diameter

*Dr. Ed. Anderson, consultant.

was found. This was incised by the Fredet-Rammstedt method.

Intermittent emesis continued to the ninth postoperative day. The patient was discharged on the fourteenth postoperative day, weighing 5.280 kilograms (11 pounds 10¼ ounces).

At present the patient is a healthy child of a little over three years age.

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TRANSURETHRAL RESECTION FOR BENIGN HYPERTROPHY OF THE PROSTATE GLAND*

C. D. Creevy, M.D.

Minneapolis, Minnesota

Benign hypertrophy of the prostate should be treated surgically when it impairs comfort or health and resists (as it usually does) medical management. There has been, and still is, a great increase in the number of patients seeking relief from this disorder, presumably due to the same factors which have produced the depression, the Townsend Plan, and Social Security, i.e., increased longevity. The number of males living past sixty-five increased from 1,900,000 in 1911 to 3,800,000 in 1936. In 1939 the average age at death of the industrial policyholders of the Metropolitan Life Insurance Company had reached 62.5 years, and the end is not yet.

Three approaches to the hypertrophied gland are available, the suprapubic, the perineal, and the transurethral. Suprapubic enucleation is easily accomplished but somewhat hazardous. Convalescence is often tedious. It is the operation of choice for the occasional operator, and for the very large glands.

Perineal enucleation requires mastery of an exacting technique. Because of the danger of injuring the rectum and external vesical sphincter, it is the most interesting (and exciting) of the three. However, mortality is low and results excellent in the hands of experts, although convalescence may be tedious, and incontinence is a bit too common for comfort in most hands.

Transurethral resection also requires an exacting technique, to be acquired only by a large experience not readily available to many surgeons. Its advantages are: low risk, short hospitalization, and good functional results.

It must be emphasized that the expert can avail himself of all three methods to good advantage.

Indications for Transurethral Resection

The precise indications for employing transurethral resection as compared to enucleation are not yet clear. It is generally agreed that resection is indicated in contractures, carcinomas which have extended locally, and "small to moderate sized" hypertrophies. It is argued that the configuration of the gland may indicate or contraindicate resection, but this is, in my opinion, incorrect. The only true contraindications are inability to insert the instrument, strictures too far back to permit their circumvention by urethrotomy, and hypertrophies so large as to necessitate more than two sessions or the employment of so much diathermy current as to inflict irreparable damage upon the prostatic remnant. One cannot describe the size of such a gland in terms of grams without knowing the skill, experience, and inclinations of the operator. In different hands, the size of the prostate which is "too large for resection" may vary from twenty-five to one hundred and fifty grams. In my own hands at present the upper limit is about one hundred and twenty grams.

Technique

Pre-operative drainage by catheter is employed when needed; i.e., for impaired renal function, acute infections with fever, and extra-urogenital disorders requiring treatment, such as diabetes and cardiac decompensation. To "drain" the robust individual with good renal function simply because he has residual urine is to invite catastrophe.

Spinal anesthesia is used for good risks without severe hypertension. The attendant relaxation and lowered blood pressure facilitate operation by reducing bleeding. A falling blood pressure is to be combated by use of Trendelenburg's position and intravenous

*From the Division of Urology of the Department of Surgery, Medical School, Minneapolis.

fluids, and not by the ill-advised administration of vasoconstrictors, since they often promote bleeding.

The instrument which I prefer is an illegitimate combination of those of Stern, McCarthy, Nesbit and, doubtless, of others. Its advantage is that it can be handled with one hand. The O'Conor sheath permits the insertion of a finger into the rectum, and is always used. Thus tissue may be displaced with one hand and cut off with the other.

Operation is begun on the roof of the prostatic urethra, where division of the anterior commissure permits the lateral lobes to drop backwards. Resection is then carried backward, and later medially, between the surgical capsule and the lateral lobe, first on one side, then on the other, until the lateral and median lobes are attached only by a narrow vertical pedicle. Bleeding from the cut surfaces is then controlled, and the pedunculated mass removed piecemeal. The objective is a pear-shaped urethra without intrusions into lumen or bladder, and a prostatic remnant which feels thin when palpated over the sheath of the instrument. The method outlined is that of Nesbit.

Control of hemorrhage depends primarily upon electrocoagulation at the time of operation, but the Foley bag is used routinely as an aid to hemostasis. Postoperative irrigation is carried out with a closed sterile system often enough to prevent plugging of the catheter by clots. Transfusion is employed freely, giving blood while there is still doubt as to whether it is needed; it is not infrequently begun during operation. Excessive postoperative bleeding is controlled by cystoscopic electrocoagulation.

The catheter is removed on the third day, or later if fever has not subsided by then. If urination is not comfortable and complete within three or four days of removal of the catheter, resection is repeated.

Results

Table I is a summary of the whole experience with transurethral resection at the University Hospital from April, 1930, to April, 1941.

Most conspicuous is the increase in amount of tissue removed from 3.3 grams in 1930 to 37.4 grams in 1941. If contracted glands were eliminated from the series, this figure would rise above forty grams. Since Alcock found that two-thirds of 500 consecutive specimens enucleated suprapubically weighed less than 30 grams, and since 1,000 consecutive hypertrophied prostates enucleated at the Mayo Clinic averaged 44 grams in weight, it is evident that the term "transurethral prostatectomy" is beginning to be justified.

The average mortality of 4.3 per cent is nothing to boast about, but the type of patient seen at the University Hospital and the circumstances surrounding his admission make it unlikely that much improvement can be expected, although this year's mortality so far is 2.5 per cent. The figure on hospital stay is especially satisfactory in view of the fact that nearly all patients come from out of the city, and the figure refers to the pre- and postoperative stays combined.

The number of enucleations done during the last five years is too small for statistical purposes. Radical perineal prostatectomy has been used in a few cases of operable cancer; perineal enucleation has been done some twenty-five times, more to develop the technique than from any conviction concerning its precise indications; and suprapubic enucleation, because of the risk involved, has been carried out only occasionally, usually for very large glands, or because of some contraindication to the other methods.

TABLE I. SUMMARY OF TRANSURETHRAL RESECTIONS
April, 1930, to April, 1941

Year	Number of Cases	Percent Repeated	Mortality Percent	Tissue Removed (Gm.)	Hospital Stay
1930	18	16	0	3.3	29.0
1931	27	25	3.7	3.1	31.0
1932	18	38	11.1	4.5	23.0
1933	102	22	3.9	9.7	20.0
1934	103	17	2.9	18.4	17.0
1935	133	29	3.0	22.3	13.0
1936	160	28	4.3	26.6	14.9
1937	133	23	7.5	20.1	17.0
1938	174	14	4.0	25.7	12.6
1939	167	22	4.2	26.9	16.6
1940	155	20	3.8	37	15.9
1941 (to April 1)	40	17	2.5	37.4	15.0
Total	1229	23	4.3	24.8	16.2

Conclusions

Increased experience with transurethral resection has led to increased applicability. Indications for enucleation decrease in frequency as experience with resection grows, so that enucleation is required only occasionally. Transurethral prostatectomy is becoming a reality.

Discussion

Dr. T. H. Sweetser: In his frank and modest way Dr. Creevy has given us a very interesting and instructive presentation of his experience with transurethral prostatic resection. He should be very proud of his results.

I agree with his statement that the removal of the adenomatous mass should be fairly complete to get the best results. I also agree that the surgeon's experience, his skill relatively in the different methods and his temperament may justifiably influence his approach to a particular case of prostatic hypertrophy. I use transurethral resection for perhaps 90 per cent of my cases of prostatic obstruction, but there are cases for which I prefer suprapubic enucleation and some for which I prefer perineal prostatectomy. The use of the Foley bag catheter, as used after transurethral resection, allows us sometimes to enucleate a large gland and then close the wound completely, depending on catheter drainage. Cystography in conjunction with rectal examination will help one in preliminary estimation of the problem in each case. I wish to show a few cystograms and to discuss their interpretation.

Dr. Creevy's excellent discussion of resection technic and after-care has fortified my own feeling in some respects, and has suggested a few modifications of my methods that undoubtedly will be helpful.

FRACTURES OF THE OLECRANON*

(Abstract of paper to be published later)

U. Schuyler Anderson, M.D.
Miland E. Knapp, M.D.
and
Daniel J. Moos, M.D.
Minneapolis, Minnesota

Although fractures of the olecranon are not common, the study of their management is of interest because the multiplicity of methods used to treat this fracture indicates that the end results have not been generally satisfactory. Thirty-two cases of this fracture were analyzed.

From 1934 to 1940 inclusive, 5,151 fractures, of which 32 or 0.61 per cent were fractures of the olecranon, were treated at the Minneapolis General Hospital. Recovery was complete with little or no loss of function in thirteen cases with no separation of the fragments. There were nineteen fractures of the process with separation of the fragments from ⅛ to 1 inch. Closed reduction was tried and failed in ten instances. Open reduction and internal fixation were employed in twelve cases. Vitallium screws and stainless steel wire were the preferred internal fixatives. A plaster cast was applied to the arm after operation in nine cases while the application of an elastic bandage was the only means of immobilization in three instances.

Return of function was extremely slow in those cases in which a cast was applied after operation. Separation of the fragments occurred in spite of the employment of stainless steel wire and the application of a cast to the arm with the elbow extended. The earliest and best return of function followed in the three cases in which no external immobilization other than an elastic bandage was used.

It was concluded that fractures of the olecranon without separation produce little or no permanent loss of function of the elbow. The amount of separation is of some prognostic value since it indicates the severity of the injury. Those fractures with a large amount of separation had the greatest subsequent loss of function. Fractures with separation of the fragments of more than ⅛ inch should be treated by open reduction and internal fixation. Careful attention to detail in the insertion of the internal fixative is necessary for success. No external fixative such as a cast or splint is necessary since immediate mobilization insures better function and tends to prevent separation of the fragments.

Discussion

Dr. James Johnson: Dr. Anderson, would you mind repeating how you immobilize the elbow following fractures of olecranon?

Dr. Anderson: I do not believe that any method of immobilization is necessary following fractures of the olecranon. The application of a cast will not prevent contractions of the triceps muscle. The position of the elbow, whether in flexion or extension, furthermore, will not prevent contraction of this muscle. Extension of the elbow is particularly bad from the standpoint of return of function. It is our opinion that it is better to permit free motion of the forearm in order that there is no resistance to the contractions of the triceps muscle, rather than to use some form of immobilization.

*From the Fracture Service of the Minneapolis General Hospital, A. A. Zierold, Chief. Presented by invitation.

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

(Continued from Page 687)

That tells you that it takes the proper soil for the carcinoma cell to take hold. That explains also why, for instance, in carcinoma of the thyroid, we get metastases in particular bones. In carcinoma of the prostate we know where we are most likely to find metastases.

If, before operation, instead of trying to kill the carcinoma cells by radiation, we just damage them to a notable degree by giving them a moderate amount of x-ray, then the carcinoma cell is much less apt to find a soil which is ready to let it grow.

I think the whole picture of the many difficulties that are encountered in the large community hospitals is very valuable and I congratulate the doctor on his thesis.

Dr. Alberts (in closing): There was nothing I can recall in looking over those old charts that indicate there were any urinary complications Dr. Hullsiek refers to. Some of the patients had trouble in voiding afterwards but they all straightened around after a short time, and I do not believe there were any records of any permanent bladder complications.

The meeting adjourned.

E. V. Kenefick, M.D.
Secretary

DIET BY TAXATION

Hardly a person now alive remembers the time when federal taxes were levied alone for the simple purpose of raising revenue. It requires no genius to discover that the power of taxation may be put to other uses. Although the Supreme Court of the United States in a memorable decision declared that the power to tax is the power to destroy, few citizens pay much attention to the implications of that statement. In our national life the levying of taxes is being increasingly used as an economic instrument. Taxation is becoming the favorite tool of economic pressure groups who desire to liquidate other pressure groups. The dairy interests, for example, have been conspicuous in their employment of taxation to suppress competing articles of food. Perhaps this example suggested the idea that people could be compelled by taxation to eat what is good for them. In a recent article "Fortification of Foodstuffs"† the proposal is made to compel the use of whole wheat bread by placing a tax on white bread and by offering a government subsidy for the manufacture of whole wheat bread. Perhaps some one will next propose the taxation of beef with a subsidy for the pork packers because pork is richer in vitamin B_1. The government could put a similar levy on grapefruit with a subsidy for orange juice because the latter contains a little more vitamin C. Producers of cane sugar might ask for taxation of corn sugar because cane sugar is sweeter, or sheep raisers might urge a tax on cotton goods because woolens are warmer. If it were not that the power of taxation has been so frequently and so outrageously employed, one could hardly take the latest proposal seriously.—Jour. A.M.A., 117:294 (July 26) 1941.

†Luck, J. Murray: Fortification of Foodstuffs, Nutrition Conference, University of California, Berkeley, Calif., May 3, 1941; Science **94**: 31 (July 11) 1941.



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REPORTS and ANNOUNCEMENTS

AMERICAN COLLEGE OF SURGEONS

The thirty-first annual Clinical Congress of the American College of Surgeons will be held in Boston, November 3 to 7, 1941. Headquarters will be at the Statler and Copley-Plaza Hotels. The program will include clinics and demonstrations in local hospitals and medical schools, as well as scientific sessions and exhibits in the headquarters hotels.

Dr. Irvin Abell of Louisville is chairman of the Board of Regents and Dr. Evarts A. Graham of Saint Louis is president. Dr. W. Edward Gallie of Toronto is president-elect. Dr. Malcolm T. MacEachern is chairman of the Administrative Board with headquarters at 40 East Erie Street, Chicago.

INTERNATIONAL ASSEMBLY

This year's International Assembly of the Inter-State Postgraduate Medical Association of North America will be held in the public auditorium, Minneapolis, Minnesota, October 13, 14, 15, 16, and 17.

The high standing of the medical profession of Minneapolis, combined with the unusual clinical facilities of its great hospitals and excellent hotel accommodations, make this city an ideal place in which to hold the Assembly.

The Hennepin County Medical Society will be host to the Assembly and has arranged an excellent list of committees who will function throughout the Assembly.

The officers of the Inter-State Postgraduate Medical Association, those of the Hennepin County Medical Society and the Minnesota State Medical Association, extend a very cordial invitation to all members of the profession in good standing to attend the Assembly.

The members of the profession are urged to bring their ladies with them as a very excellent program is being arranged for their benefit by the Ladies' Committee.

A full program of scientific and clinical sessions will take place each day and evening of the Assembly, starting at 8:00 o'clock in the morning.

In coöperation with the Hennepin County Medical Society, the Minnesota State Medical Association and the Minneapolis Civic and Commerce Association, a most excellent opportunity for an intensive week of postgraduate medical instruction is offered by approximately eighty-five distinguished teachers and clinicians from different parts of the United States and Canada who are honoring the Assembly by contributing to the program. The speakers and subjects have been carefully selected by the program committee.

Pre-assembly and postassembly clinics will be conducted, free of charge, in the Minneapolis Hospitals on the Saturdays previous and following the Assembly for visiting members of the profession.

Excellent scientific and commercial exhibits of great interest to the medical profession will be an important part of the Assembly. These exhibits will be open to members of the medical profession in good standing without paying the registration fee.

The registration fee for the scientific and clinical sessions will be $5.00.

Members of the profession who can possibly arrange to attend the Assembly cannot afford to miss it.

With a great deal of pride and satisfaction, we call your attention to the list of distinguished teachers and clinicians who are to take part on the program and whose names appear on page 698 of the advertising section of this journal.

Roscoe R. Graham, M.D., President, Toronto, Canada

George W. Crile, Chairman, Program Committee, Cleveland, Ohio.

William B. Peck, M.D., Managing Director, Freeport, Ill.

Berton J. Branton, M.D., President,
Minnesota State Medical Association,
Willmar, Minn.

Benjamin B. Souster, M.D., Secretary,
Minnesota State Medical Association,
St. Paul, Minn.

Russell W. Morse, M.D., President,
Hennepin County Medical Society,
Minneapolis, Minn.

Lewis M. Daniel, M.D., Secretary,
Hennepin County Medical Society,
Minneapolis, Minn.

Charles E. Proshek, M.D., General Chairman, Minneapolis Committees,
Minneapolis, Minn.

MISSISSIPPI VALLEY MEDICAL SOCIETY

The seventh annual meeting of the Mississippi Valley Medical Society will be held in the Hotel Montrose, Cedar Rapids, Iowa, October 1, 2, and 3, 1941. Some forty lectures and demonstrations and thirty-two instructional courses are listed. On October 1 eight Kansas City clinicians will take part. Dr. Joseph B. DeLee, Emeritus Professor of Obstetrics and Gynecology, University of Chicago, will be among the speakers at the banquet on October 2.

Dr. Robert B. Lewy, Chicago, has been announced the winner of the annual Essay Contest and will present his essay on "Comparative Studies in Pain Control" at the meeting.

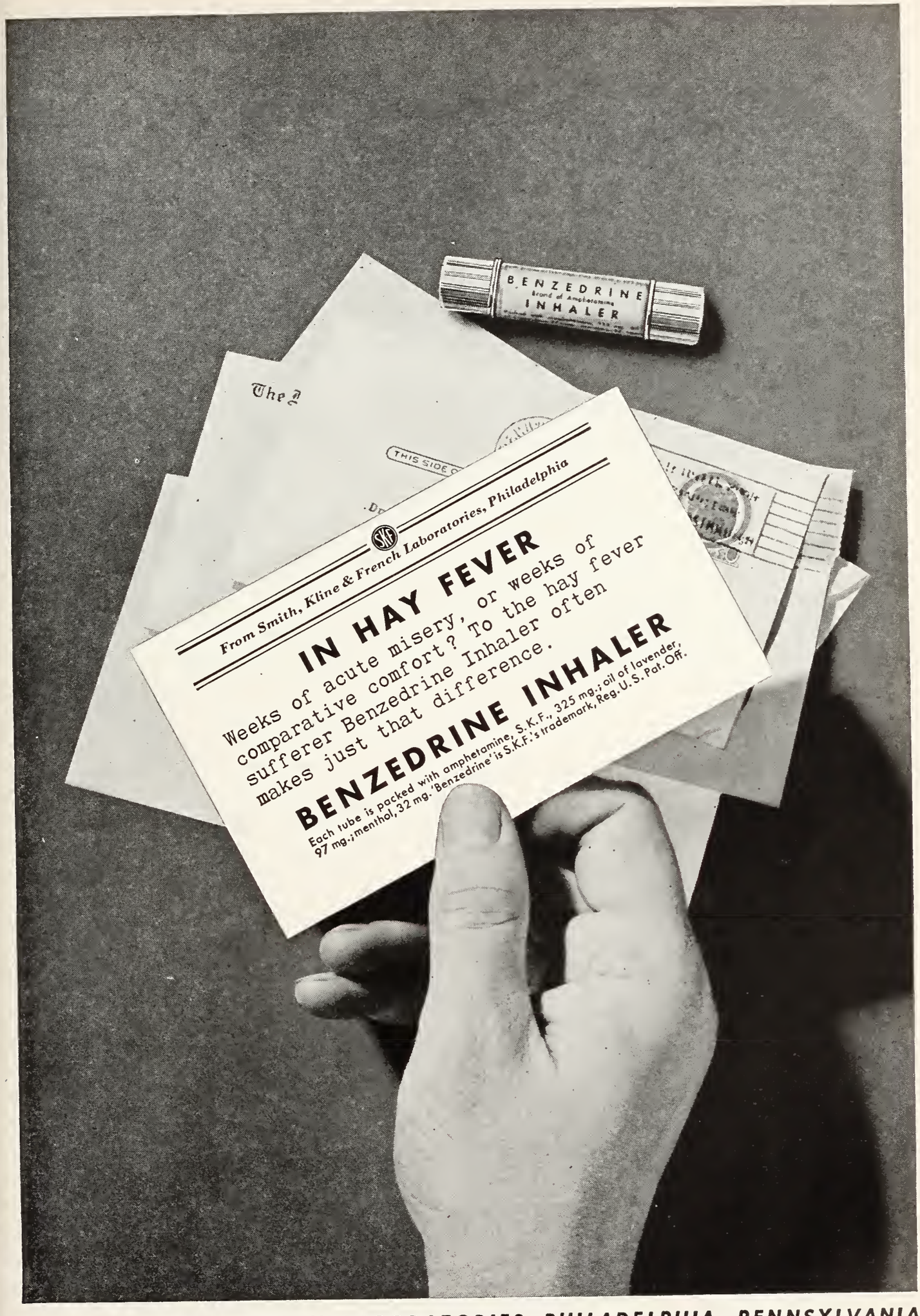
The secretary, Dr. Harold Swanberg, W. C. U. Building, Quincy, Illinois, may be addressed for further information.

MINNESOTA TRUDEAU SOCIETY

Fifty members of the Minnesota Trudeau Society attended a quarterly meeting of the organization in Rochester, June 20, over which Dr. W. S. Lemon presided. A luncheon preceded the meeting, at which papers were given by Rochester physicians. Dr. W. H. Feldman arranged the program.

The August meeting will be held in Eau Claire, Wisconsin.

(Continued on Page 696)



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NORTHERN MINNESOTA MEDICAL ASSOCIATION

The annual meeting of the Northern Minnesota Medical Association will be held in St. Cloud, Minnesota, Friday and Saturday, August 15 and 16, with headquarters at the Hotel St. Cloud. The program will be as follows:

Friday, August 15

Morning—8:00 to 11:50 a.m.

Registration

"Hematology of Pernicious Anemia" (Illustrated) CHARLES VANDERSLUIS, M.D., and D. F. MCCANN, M.D., Bemidji

"Our Aging Population"—J. F. NORMAN, M.D., Crookston

"Nephritis"—MOSES BARRON, M.D., Minneapolis

"Roentgenological Studies in Edema of the Lungs" CURTIS B. NESSA, M.D., St. Cloud

"Treatments of Hemorrhoids" (Illustrated)—J. K. ANDERSON, M.D., Minneapolis

Afternoon—2:00 to 4:30 p.m.

"Traumatic Stricture of Common Duct"—JOHN R. PAYNE, M.D., University of Minnesota

"Preparation of a Bed for Home Delivery" (Illustrated)—F. J. SCHATZ, M.D., St. Cloud

"Thyroid Gland Disturbances in Children" — ROGER KENNEDY, M.D., Rochester

"Carcinoma of Larynx" (Operative Technique, illustrated with colored films)—ORVILLE NELSON, M.D., St. Petersburg, Florida

Evening—6:30 p.m.

Banquet at the Country Club

Toastmaster.....W. A. O'BRIEN, M.D., Minneapolis

President's Address, JULIAN DUBOIS, M.D., Sauk Center

Address—"Americanization, A Challenge to Citizenship" SENATOR H. L. WAHLSTRAND, Willmar

Saturday, August 16

Morning—9:00 to 11:50 a.m.

Business meeting

"Recent Advances in Kidney Function"—ARTHUR H. WELLS, M.D., Duluth

"Clinical Pathological Conference"

Conducted by E. L. TUOHY, M.D., Duluth

Participants: GEORGE BERDEZ, M.D., ALBERT KELLEY, M.D., JOHN GRABOW, M.D., GORDON MACRAE, M.D., ELIZABETH BAGLEY, M.D., A. L. ABRAHAMS, M.D., J. R. MCNUTT, M.D., all of Duluth.

The information bureau and the registration desks for both the doctors and ladies will be open at the Hotel St. Cloud, Friday, August 15, at 8 a.m. Registration fee will be $2.50. Tickets for the banquet may be obtained at the same time.

Officers of the Association are: J. F. DuBois, M.D., Sauk Centre, President; G. E. Sherwood, M.D., Kimball, Vice President; C. Jacobson, M.D., Secretary-Treasurer.



OF GENERAL INTEREST

Installed as president of the Mankato Rotary Club recently was Dr. H. B. Troost.

* * *

Dr. Cornelius A. Saffert of New Ulm was married on May 26, 1941, to Miss Helen M. Kienlen, R.N., of St. George, Minnesota.

* * *

Dr. C. C. Clay, head of St. Barnabas Hospital in Minneapolis, has been called into service as an officer in the United States Naval Reserve Corps.

* * *

Dr. H. W. Lee of Brainerd was recently installed as president of the Rotary Club in that city. Dr. Virgil E. Quanstrom is secretary of the organization.

* * *

Dr. Eugene C. Strauss of Fort Dodge, Iowa, has become associated in practice with Dr. W. R. Smith of Grand Marais in the absence of Dr. L. S. Frogner.

* * *

Minnesota men who have been elected Fellows in the International College of Surgeons, and who will attend the meeting of that organization in Mexico City, August 10 to 15, include Dr. J. D. Sturre of Minneapolis and Dr. E. W. Humphrey and Dr. O. J. Hagen of Moorhead.

Dr. William A. Owens has been appointed railway physician at Montevideo by the C. M. St. P. & P. railway.

* * *

Dr. F. W. Behmler of Morris has been re-appointed medical examiner for the civil aeronautics administration at Morris.

* * *

The marriage of Dr. Siegfried C. G. Oeljen of Waseca and Miss Adele Edith Tiede of Albert Lea took place in Albert Lea, June 24. Dr. and Mrs. Oeljen are at home in Waseca.

* * *

Dr. Richard M. Hewitt of Rochester was in Washington, D. C., last month to attend a meeting of the Committee on Information in the Division of Medical Science of the National Research Council.

* * *

A speaker on the program for the annual Graduate Fortnight of the New York Academy of Medicine to be held in New York City, October 13-24, will be Dr. Edgar V. Allen of Rochester.

* * *

Dr. H. A. Shaw of Minneapolis has taken over the practice of Dr. E. N. Nelson in Lake Park. Dr. Nelson recently became affiliated with the Bloomington-Lake Clinic in Minneapolis.

INTERNATIONAL MEDICAL ASSEMBLY

Inter-State Postgraduate Medical Association of North America

Public Auditorium, Minneapolis, Minnesota, October 13, 14, 15, 16, 17, 1941

Pre-Assembly Clinics, October 11; Post-Assembly Clinics, October 18, Minneapolis Hospitals

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Walter C. Alvarez, Rochester, Minn.
W. Wayne Babcock, Philadelphia, Pa.
Lewellys F. Barker, Baltimore, Md.
Claude S. Beck, Cleveland, Ohio.
E. T. Bell, Minneapolis, Minn.
Herrman L. Blumgart, Boston, Mass.
Peter T. Bohan, Kansas City, Mo.
William F. Braasch, Rochester, Minn.
Carl D. Camp, Ann Arbor, Mich.
James G. Carr, Chicago, Ill.
Richard B. Cattell, Boston, Mass.
Russell L. Cecil, New York, N. Y.
Frederick Christopher, Evanston, Ill.
Warren H. Cole, Chicago, Ill.
Frederick A. Coller, Ann Arbor, Mich.
C. Donald Creevy, Minneapolis, Minn.
William R. Cubbins, Chicago, Ill.
Elliott C. Cutler, Boston, Mass.
Walter E. Dandy, Baltimore, Md.
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Claude F. Dixon, Rochester, Minn.
Daniel C. Elkin, Atlanta, Ga.
John F. Erdmann, New York, N. Y.
A. Carlton Ernstene, Cleveland, Ohio.
Ernest H. Falconer, San Francisco, Calif.
Warfield M. Firor, Baltimore, Md.
John R. Fraser, Montreal, Canada
Henry J. Gerstenberger, Cleveland, Ohio.
Harry S. Gradle, Chicago, Ill.
Evarts A. Graham, St. Louis, Mo.
Roscoe R. Graham, Toronto, Canada.
Howard K. Gray, Rochester, Minn.
Robert G. Green, Minneapolis, Minn.
Russell L. Haden, Cleveland, Ohio.
Emile F. Holman, San Francisco, Calif.
Verne C. Hunt, Los Angeles, Calif.
Thomas E. Jones, Cleveland, Ohio.
Elliott P. Joslin, Boston, Mass.
Louis J. Karnosh, Cleveland, Ohio.
Chester S. Keefer, Boston, Mass.
H. Dabney Kerr, Iowa City, Iowa.
J. Murray Kinsman, Louisville, Ky.
Herman L. Kretschmer, Chicago, Ill.
Frank H. Lahey, Boston, Mass.
N. Logan Leven, St. Paul, Minn.
William E. Lower, Cleveland, Ohio
Charles W. Mayo, Rochester, Minn.
John L. McKelvey, Minneapolis, Minn.
John C. McKinley, Minneapolis, Minn.
Irvine McQuarrie, Minneapolis, Minn.
John J. Moorhead, New York, N. Y.
George P. Muller, Philadelphia, Pa.
Clay Ray Murray, New York, N. Y.
John H. Musser, New Orleans, La.
Horace Newhart, Minneapolis, Minn.
Emil Novak, Baltimore, Md.
Frank R. Ober, Boston, Mass.
Eric Oldberg, Chicago, Ill.
Paul A. O'Leary, Rochester, Minn.
Oliver S. Ormsby, Chicago, Ill.
Ralph Pemberton, Philadelphia, Pa.
Dallas B. Phemister, Chicago, Ill.
Isidor S. Ravdin, Philadelphia, Pa.
Hobart A. Reimann, Philadelphia, Pa.
Erwin R. Schmidt, Madison, Wis.
Elmer L. Sevringhaus, Madison, Wis.
George E. Shambaugh, Chicago, Ill.
Leroy H. Sloan, Chicago, Ill.
Thomas P. Sprunt, Baltimore, Md.
Virgil P. W. Sydenstricker, Augusta, Ga.
Willard O. Thompson, Chicago, Ill.
Maurice B. Visscher, Minneapolis, Minn.
Waltman Walters, Rochester, Minn.
Owen H. Wangensteen, Minneapolis, Minn.
Soma Weiss, Boston, Mass.
Henry M. Winans, Dallas, Texas
Wallace M. Yater, Washington, D. C.
Hugh H. Young, Baltimore, Md.

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HOTEL RESERVATIONS

Hotel Committee: A. N. Bessesen, Jr., Chairman, 2000 Medical Arts Bldg., Minneapolis, Minnesota.

A program will be mailed to every member of the medical profession in good standing in the United States and Canada on or about September first.

Any member of the profession in good standing who does not receive a program, please write the Managing-Director and one will be mailed.

COMPREHENSIVE SCIENTIFIC AND TECHNICAL EXHIBIT. SPECIAL ENTERTAINMENT FOR THE LADIES

Dr. Albert D. Mattson, formerly of Milaca, is now located at Atwater, having taken over the practice of Dr. Lloyd C. Gilman who has been called to duty with the United States Army.

* * *

Dr. Vernon L. Hart of Minneapolis, who maintains offices at 820 Medical Arts Building, has resumed his practice after completing a period of active service with the United States Navy Medical Corps.

* * *

Dr. A. F. Settlage, who has been a member of the Worthington Clinic staff in Worthington since November, 1938, terminated his association with the clinic July 1 to enter private practice at Newburyport, Massachusetts, the home of Mrs. Settlage's parents.

* * *

Four Rochester men are scheduled to present papers at the twenty-seventh annual convention of the Radiological Society of North America in San Francisco in November. They are Drs. John D. Camp, A. U. Desjardins, R. E. Fricke and C. G. Sutherland.

* * *

Dr. L. H. Heinz, a graduate of the University of Minnesota medical school, has become associated in practice with Dr. H. A. Fasbender of Hastings. Dr. Heinz recently completed his internship at St. Joseph's Hospital in Saint Paul.

Dr. John Minckler of Buhl, a graduate of the University of Minnesota School of Medicine, has become associated with the Malmstrom-Sarff Clinic of Virginia. He served his internship at Ancker Hospital in Saint Paul.

* * *

Dr. Woodard Colby and Dr. Alfred J. Ouellette of Saint Paul last month opened a suburban office at 2062 Ford Parkway in the Highland Village district. They will continue to maintain their offices at 809 Lowry Medical Arts Building.

* * *

The Emerson Clinic, located in the new building on East Seventh and Mound Boulevard, Saint Paul, was formally opened Saturday, July 26, 1941. Members of the group are: E. C. Emerson, M.D., R. H. Beach, M.D., G. W. Ittner, Jr., M.D., D. M. DeCourcy, M.D, F. A. Crahen, D.D.S., and B. A. Johnson, B.S., Ph.C.

* * *

Dr. Herbert Boysen, who has been practicing medicine in Welcome for the past fifteen years, is now located in Madelia, occupying offices formerly used by Dr. H. B. Grimes. Dr. Boysen recently completed a two-months' course at the Cook County (Illinois) Post-Graduate School of Medicine.

Dr. P. E. Sheppard recently observed the fiftieth anniversary of his graduation from the University of Minnesota medical school. He was a member of the first regular class to be graduated, although individuals had previously received degrees. Dr. Sheppard has spent forty-eight of the fifty years he has been practicing in Hutchinson.

* * *

Dr. Samuel Nesbitt, a fellow in internal medicine in the Mayo Foundation at Rochester, has been appointed an instructor in medicine at Yale University. He will be engaged in research work and teaching at Yale, and will be a member of the staff of the New Haven hospital, associated with the University.

* * *

Among speakers on the program of the seventh midsummer radiologic conference of the Denver Radiological Club held in Denver, Colorado, July 31-August 1 and 2, was Dr. John D. Camp of Rochester, whose subject was "Roentgenologic Observations Concerning Osteoporosis and Its Relation to Systemic Diseases."

* * *

Dr. and Mrs. W. C. Basom of Saint Paul and Rochester have gone to El Paso, Texas, where Dr. Basom will be associated in practice with Dr. Louis Breck, orthopedic surgeon. Dr. Basom recently completed a three-year fellowship at the Mayo Foundation and received his master's degree in orthopedic surgery from the University of Minnesota.

Dr. John J. Prendergast, clinical instructor in ophthalmology at the University of Minnesota School of Medicine, who has been practicing in Saint Cloud and Saint Paul, has gone to San Diego, California, where he will be in charge of the ophthalmology department of the Rees-Stealy Clinic.

* * *

Dr. C. W. Jacobson has joined the staff of the Bratrud Clinic in Thief River Falls. A native of Kerkhoven, he is a graduate of the University of Minnesota School of Medicine, and has served internships at Swedish Hospital in Minneapolis and at Ancker Hospital in Saint Paul.

* * *

Minnesota physicians who have been relieved from further active duty with the United States Army include:

Dr. Grant Edmund Olson of West Concord, first lieutenant, who has been serving with the 30th Field Artillery at Camp Roberts, California.

Dr. Ernest Sterling Palmerton of Albert Lea, first lieutenant, who has been serving with the 85th Field Artillery at Camp Roberts, California.

* * *

The new addition to St. Mary's hospital in Rochester was completed last month. The addition increases the capacity of the hospital to 868 beds, after allowing for the discontinuance of older sections of the building, and makes St. Mary's the largest private hospital in one unit in the United States. Expansion to 1,000 beds is readily possible.

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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA

Dr. Walter Gardner of the Anoka State Hospital in Anoka is the president-elect of the Minnesota Hospital Association. Miss Esther Wolfe of the St. Andrew's Hospital in Minneapolis is serving as president this year. Other officers include: Dr. Thomas E. Broadie of Ancker Hospital in Saint Paul and Dr. George H. Freeman of Saint Peter State Hospital in Saint Peter, trustees. Dr. A. F. Branton of the Willmar Clinic in Willmar is executive secretary.

* * *

Dr. J. Lawrence McLeod of Grand Rapids, Minnesota, was elected district governor of Rotary International at the convention held in Denver, Colorado, in June. His district includes Minnesota, North Dakota, Wisconsin and Ontario, and one of his duties will be to assist club officers in his district in administrative matters.

* * *

Medical reserve corps officers ordered to extended active duty within the past few weeks are:

Dr. Thomas J. Edwards of St. Paul, first lieutenant, assigned to Corps Area Service Command Station Hospital at Fort Leonard Wood, Missouri.

Dr. Robert J. Tenner of Rochester, first lieutenant.

Dr. William Oscar Clarke of Minneapolis, first lieutenant, to Corps Area Service Command Station Hospital at Fort Leonard Wood, Missouri.

* * *

Dr. John S. Lundy of Rochester has been named to the Board of Public Health and Welfare to succeed Dr. T. B. Magath who has been ordered to military duty. A commander in the United States Navy Medical Reserve Corps, Dr. Magath has been called for active duty for an indefinite period. He is attached to the surgeon general's office in Washington.

* * *

Physicians whose orders to report for active duty in the United States Army have been revoked include: Drs. Carl J. Fritsche of New Ulm, Harry Bryan Neel of Albert Lea, Harry Allen Palmer of Blackduck, David Howard Rolig of Howard Lake, Clifford T. Wadd of Janesville, Richard A. Whitney of Cambridge, and Dr. Richard H. Barrett of Rochester.

* * *

Dr. John M. Adams of Minneapolis, clinical assistant professor of pediatrics at the University of Minnesota School of Medicine, has been appointed to take charge of the out-patient pediatrics department. He succeeds Dr. Chester A. Stewart, who resigned to head the pediatrics department at the Louisiana State University Medical School in New Orleans.

* * *

A new twelve-month course for physical therapy technicians was inaugurated at the University Hospitals, June 16, with the start of the first summer session. Dr. M. E. Knapp heads the course which is opened to graduates who have degrees in physical education, nursing or medical technology.

Both civilian hospitals and army hospitals need more men skilled in physical therapy. These technicians will be concerned with the physical side of treatment and will work in such mediums as muscle reëducation, diathermy, massage, heat therapy, under a doctor's direction.

* * *

The National Foundation for Infantile Paralysis has granted $10,000 for a 25-bed clinic at the University Hospitals for treatment of poliomyelitis by the system evolved by Sister Elizabeth Kenny, Australian nurse.

In connection with this, the Minneapolis Board of Public Welfare hospital committee has recommended that funds be provided for training two graduate nurses and Kenny technicians at General Hospital and that fullest coöperation be given in the establishment of an out-patient department.

A report on Sister Kenny's work by Dr. Wallace H. Cole and Dr. Miland E. Knapp of the University of Minnesota appears in the June 7 issue of *The Journal of the American Medical Association.*

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When the Upper Peninsula Medical Association met in Ironwood, Michigan, July 17 and 18, papers were presented by several Minnesota men. Physicians on the program and their subjects included: Dr. Herman O. McPheeters of Minneapolis, "Treatment of Varicose Veins"; Dr. Louis A. Buie of Rochester, "Rectal Diseases"; Dr. Leo G. Rigler of Minneapolis, "X-ray in Acute Conditions of the Abdomen"; and Dr. Charles W. Mayo of Rochester.

* * *

Dr. William C. Bernstein, who recently completed his graduate training in proctology at the University and Minneapolis General hospitals, has opened offices at 934 Lowry Medical Arts Building, Saint Paul, where his practice will be limited to diseases of the rectum and colon. Dr. Bernstein will continue his affiliation with the proctology service at the University hospitals.

Dr. Bernstein practiced at New Richland, Minnesota, before beginning his graduate work at the University.

* * *

Dr. John J. Catlin of Buffalo, Minnesota, was selected as "typical of Minnesota's hard-working country doctors" by the *Minneapolis Tribune and Star Journal* for a pictorial feature, entitled "A Day with a Minnesota Country Doctor," which appeared in its June 29 issue. Dr. Catlin, who is sixty-one years old, has been practicing medicine in Buffalo for thirty-eight years. His grandfather and father were physicians, as is his son, Dr. Theodore J. Catlin, who is associated with him in practice.

* * *

Dr. George Bergh of Minneapolis, son of Dr. and Mrs. L. N. Bergh of Montevideo, has opened an office in Montevideo. Dr. Bergh is maintaining his connection with the University of Minnesota Medical School, where he is clinical instructor, and also his Minneapolis office in the Medical Arts Building. He is arranging his schedule so that he will spend Friday, Saturday and Monday of each week at his office in Montevideo, and Tuesday, Wednesday and Thursday at his Minneapolis office.

* * *

The newly remodeled Medical Center Building of Dr. R. G. Hassett in Mankato was opened recently with Dr. Hassett and Dr. Walter B. Kaufman occupying the ground floor. Dr. Hassett has been practicing in Mankato for fourteen years and Dr. Kaufman, formerly of Winthrop, has been practicing there two years.

The building is arranged to provide five office suites on the first and second floors for physicians and dentists. The offices have a joint reception room. An ambulance entrance has been provided.

* * *

A grant of $52,000 from the Rockefeller Foundation for a coöperative program of research in biology and medicine to be conducted by the Mayo Foundation and the University of Minnesota staff members, was accepted last month by the university board of regents.

The grant is to be used in the study of radioactive isotopes as tracers of fundamental biological mechanisms. Under the direction of Dean John T. Tate, uni-

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versity staff members in biology, chemistry, physics and medicine, together with the Mayo Foundation, have conducted this research since 1937 when a grant of $36,000 was made by the Rockefeller Foundation.

Another grant of $17,000 from the Rockefeller Foundation for support of research in the field of biophysics under the direction of Otto H. Schmitt, instructor in physics and biology at the University of Minnesota, was also accepted.

* * *

Two intensive courses in physical therapy technic are being given by the Mayo Clinic in Rochester during the present national emergency to prepare technicians for civilian and governmental work.

The first course began July 1, and the second will get under way January 1. Six months of intensive, didactic training will be given in Rochester and will be followed by six months of practical training in one of the military, medical institutions. To those who do not wish to enter governmental service, six months of practical training will be given in Rochester following completion of the didactic course. Each course will be limited to thirty students for governmental service and ten students for civilian service.

* * *

Newly elected members of the University of Minnesota chapter of Sigma Xi include Dr. A. Louis Dippel, associate professor of obstetrics and gynecology at the University of Minnesota School of Medicine; Dr. John L. McKelvey, professor and head of the department of obstetrics and gynecology; Dr. John A. Layne, instructor in the medical school who left July 1 for Great Falls, Montana, to become associated with the Great Falls Clinic; Dr. John M. Adams, clinical instructor in pediatrics; Dr. Robert E. Priest, medical fellow in otolaryngology; Dr. Richard L. Varco, teaching fellow; Dr. Wallace Sako, medical fellow in pediatrics; Dr. Clarence P. Truog; Dr. Robert L. Meller also of the Medical School.

* * *

The WPA hospital project now being carried on in Minneapolis at General and University of Minnesota Hospitals is being expanded to a state-wide service. The project is for the training and furnishing of non-professional workers, mostly for maintenance work, in publicly owned hospitals throughout the state.

A total of 175 persons have been employed in the two hospitals, while 25 others were employed in a six-month training course at University Hospitals.

With the new appropriation of $841,682, the project will be extended to all forty publicly owned hospitals and sanatoria in the state. In addition to providing added service, it will furnish a reserve source from which hospitals may hire trained non-professional workers to replace those taken by war service or higher pay elsewhere.

* * *

Dr. William J. Cochrane of Lake City has retired from active practice of medicine after forty-five years of service, forty-one of which were in Lake City. With his retirement, the partnership of Dr. Cochrane and

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Dr. H. E. Bowers was dissolved, and Dr. Bowers' son, Dr. Robert N. Bowers of Mazeppa, became associated with his father in practice. The firm is now known as Bowers and Bowers.

Dr. Cochrane, who is seventy-four years old, was instrumental in forming the Lake City Hospital Association in 1916, and with the aid of a committee which he formed, he raised the initial funds necessary. The hospital developed and was replaced in 1939 by the new, modern municipal hospital. Dr. Cochrane is president of the board of directors of the new hospital.

He has served as Lake City's health officer for many years, and for forty years has been a surgeon for the Milwaukee railroad. He was a captain in the Medical Corps in the World War. For thirty-five years, he has been a director of the Lake City Bank, oldest state bank in Minnesota.

* * *

Minnesota men elected to various section offices in the American Medical Association include the following from Rochester: Dr. J. S. Lundy, secretary, section on anesthesiology; Dr. L. A. Buie, delegate, section on gastro-enterology and proctology; Dr. G. J. Thompson, vice chairman, section on urology; Dr. Paul A. O'Leary, member of the American Board of Dermatology and Syphilology.

Dr. F. P. Moersch, representative to scientific exhibit, section on nervous and mental diseases; Dr. F. C. Mann, vice chairman, section on pathology and physiology; Dr. E. V. Allen, secretary, section on pharmacology and therapeutics; Dr. W. L. Benedict, representative at council of Pan-American Congress, section on ophthalmology; Dr. R. D. Mussey, representative to American Committee on Maternal Welfare, section on obstetrics and gynecology.

Dr. Harold S. Diehl of Minneapolis was named to the executive committee of the section on preventive and industrial medicine and public health.

* * *

Promotion of the following staff members of the University of Minnesota, School of Medicine, is announced:

Dr. Welsey W. Spink, medicine, to associate professor; Dr. Charles E. McLennan, obstetrics and gynecology, to assistant professor; Dr. John M. Adams, pediatrics, to clinical assistant professor; Dr. John R. Paine, surgery, to associate professor.

Dr. Abe B. Baker, psychopathic hospital, to associate professor; Dr. William H. Hollinshead, Health Service, to physician; Dr. Lillian Cottrell, Health Service, to mental hygienist and assistant professor; Dr. Archibald H. Beard, medicine, to clinical associate professor; Dr. Royal C. Gray, medicine, to clinical associate professor; Dr. Morse J. Shapiro, medicine, to clinical associate professor; Dr. Samuel A. Weisman, medicine, to clinical associate professor; Dr. Joseph F. Borg, medicine, to clinical assistant professor; Dr. Ragnvald S. Ylvisaker, medicine, to clinical assistant professor; Dr. Lawrence R. Boies, to director of the Division of Otolaryngology; Dr. Kenneth A. Phelps, ophthalmology and otolaryngology, to clinical associate professor; Dr. John J. Hochfilzer, ophthalmology and otolaryngology, to clinical assistant professor, and Dr. Johannes K. Moen, medicine, to professor of medicine.

Also the following in pathology: To associate professor, Dr. Nathaniel H. Lufkin; to assistant professor, Drs. Frank C. Andrus, George K. Higgins, Thomas J. Kenyon and Harold H. Noran.

Promotions in surgery: Dr. C. A. Creevy, to assistant dean and professor of surgery; Dr. James A. Johnson, to clinical professor; Dr. Edward T. Evans, to clinical associate professor; Dr. Ernest Meland, to clinical assistant professor; Dr. Wallace P. Ritchie, to clinical assistant professor.

Promotions in radiology: Dr. Russell W. Morse to clinical assistant professor; Dr. Harold O. Peterson, to clinical assistant professor.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

ESSENTIALS OF ENDOCRINOLOGY. Arthur Grollman, Ph. D., M.D. Associate Professor of Pharmacology and Experimental Therapeutics in the Medical School of the Johns Hopkins University; formerly Associate Professor of Physiology and Instructor in Chemistry, same institution. 480 pages. Illus. Price, $6.00, cloth. Philadelphia: J. B. Lippincott Co., 1941.

SYNOPSIS OF DISEASE OF THE HEART AND ARTERIES. Second Edition. George R. Herrmann, M.S., M.D., Ph.D., F.A.C.P. Professor of Medicine, University of Texas; Director of the Cardiovascular Service, John Sealy Hospital; Consultant in Vascular Diseases, U. S. Marine Hospital. 468 pages. Illus. Price, $5.00, flexible binding. St. Louis: C. V. Mosby Co., 1941.

THE STRING BEAN HORSE. Camilla Wing. 30 pages. Illus. Price, $1.00, board cover. Excelsior, Minn.: Dannie Books, 1941.

THE SHINY SCOOP. Camilla Wing. 30 pages. Illus. Price, $1.00, board cover. Excelsior, Minn.: Dannie Books, 1941.

ORBITAL TUMORS—Results following the Transcranial Operative Attack. Walter E. Dandy, M.D. 168 pages. Illus. Price, $5.00, cloth. New York: Oskar Piest, 1941.

THE MARCH OF MEDICINE. New York Academy of Medicine, Lectures to the Laity, 1940. 154 pages. Price, $2.00, cloth. New York: Columbia University Press, 1941.

EFFECTIVE LIVING. C. E. Turner, A.M., Sc.D., Dr. P.H. Professor of Biology and Public Health, Massachusetts Institute of Technology; formerly Associate Professor of Hygiene, Tufts Medical and Dental Schools; formerly Director of Health Education Studies, Malden, Mass.; Chairman, Health Section, World Federation of Education Associations; and Elizabeth McHose, B.S., M.A. Director of Physical Education for Girls and Chairman of the Health Council, Senior High School, Reading, Pa. 432 pages. Illus. Price, $1.90, cloth. St. Louis: C. V. Mosby Co., 1941.

X-RAY THERAPY OF CHRONIC ARTHRITIS. (Including x-ray diagnosis of the disease). Preliminary report based on 100 patients treated at Quincy, Ill. Karl Goldhamer, M.D., Association Roentgenologist, St. Mary's Hospital and Quincy X-Ray and Radium Laboratories; formerly Roentgenologist, University of Vienna; honorary member, Mississippi Valley Medical Association, etc. Foreword by Harold Swanberg, B.S., M.D., F.A.C.P. Editor Mississippi Valley Medical Journal and Radiologic Review; roentgenologist, St. Mary's Hospital and Blessing Hospital; Director Quincy X-Ray and Radium Laboratories, etc. 131 pages. Illus. Price, $2.00, cloth. Quincy, Ill.: Radiologic Review Publishing Co., 1941.

CARDIOVASCULAR DISEASES; THEIR DIAGNOSIS AND TREATMENT. David Scherf, M.D., and Winn J. Boyd, M.D., F.A.C.P. 458 pages. St. Louis: C. V. Mosby Company, 1939.

In their book, Cardiovascular Diseases, the authors have attempted to present a concise as well as a comprehensive review of the physiology, pathology, and treatment involved in this particular field. The discussion is not confined to diseases of the heart per se, but includes also a chapter on diseases of the peripheral blood vessels which, because of their increasing frequency, are important to both the general practitioner and the specialist.

The absence of a chapter on electrocardiography does not detract from the excellence of the book; in

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fact, an attempt to outline this aspect of cardiology within a chapter would probably confuse the reader rather than guide him in the use of graphic methods of cardiac diagnosis. It seems wise to have excluded this special field in view of many excellent volumes which have been devoted to it.

The chapter on "Paroxysmal Nocturnal Dyspnea" rather disproves some of the older theories as to its etiology, and gives new ones, which in the authors' experience, are much more acceptable. The authors realize that more work must be done on this subject before an adequate explanation of all the phenomena occurring in this type of dyspnea is found.

Cor Pulmonale is a subject which has aroused new interest in the past few years and the authors give a very good description of it in their volume.

The material is well presented and the student or the practitioner of medicine, who is interested in the diagnosis and treatment of cardiovascular diseases, will find this volume well worth reading.

JOHN R. MEADE, M.D.

INTRODUCTION TO PSYCHOBIOLOGY AND PSYCHIATRY. A textbook for Nurses. Esther Loring Richard, M.D., Sc.D., Associate Professor of Psychiatry, Johns Hopkins University; Physician-in-charge of the Out-patient Department, Henry Phipps Psychiatric Clinic, Johns Hopkins Hospital; Psychiatrist-in-Chief, Baltimore City Hospitals. 357 pages. Price $2.50. St. Louis: The C. V. Mosby Company, 1941.

The text is arranged under two parts: the first is headed "Psychobiology—a study of functioning in normal behavior"; and the second, "Psychiatry or Psychopathology." The term psychobiology was introduced by Adolf Meyer some three decades ago, to refer to "Objective Psychology or Psychobiology with Subordination of the Medically Useless Contrast of Mental and Physical." Dr. Richards covers a wide range of subjects in 357 pages. And she admirably accomplishes a task which we know is a difficult one indeed. The reviewer anticipates that many, many beginning students will come to appreciate the value of this treatise which has the merits of reasonable brevity, clarity of expression, uncomplicated, though adequate, outlining and arrangement of the contents and, above all, the stamps of recognized authority in this field.

J. C. MICHAEL, M.D.

THE 1940 YEAR BOOK OF GENERAL MEDICINE. Edited by George F. Dick, M.D., J. Burns Amberson, Jr., M.D., George R. Minot, M.D., S.D., F.R.C.P. (Edinburgh and London), William B. Castle, M.D., A.M., M.D. (Hon.), Utrecht, William D. Stroud, M.D., and George B. Eusterman, M.D. 934 pages. Illus., Price $3.00, cloth. Chicago: The Year Book Publishers, 1940.

This, the fortieth issue in a long and successful series of annual compendia of abstracts of the current publications in the field of medicine, lives up to the reputation established by its predecessors as a useful volume for the busy practitioner. It contains well-illustrated digests of almost six hundred articles chosen from among more than ten times that number submitted for

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consideration. A preface recounting the history of the Year Book series, together with a recital of the distinguished names which have been identified with its publication, lends added spice, particularly for those interested in the history of medicine.

The book is divided into five sections each with separate editorial sponsorship: Infectious Diseases, George F. Dick; Diseases of the Chest, J. Burns Amberson; Diseases of the Blood and Blood-Forming Organs; Diseases of the Kidney, George R. Minot and William B. Castle; Diseases of the Heart and Blood Vessels, William D. Stroud; and Diseases of the Digestive System and of Metabolism, George B. Eusterman. At the hands of these men a vast amount of clinically useful material has been reduced to concentrated but still easily assimilable form.

M. McC. Fischer, M.D.

ENCEPHALITIS IN MINNESOTA

(Continued from Page 666)

to healthy pigeons, mice and cowbirds. Our collections indicate that the species is rather rare in Minnesota. The trap collections in the Twin Cities area in 1938 included only fourteen specimens of *triseriatus* out of a total of 337,960 mosquitoes, but in the hand catch there were six out of the total 4,166. In 1940 the species was represented by five specimens out of 184 caught while feeding in the Army Maneuvers area. This summer I have taken it several times in casual collecting at University Farm.

Ædes atropalpus.—This species, like triseriatus, was added to the list of potential vectors by Davis, 1940. It is a very small species, taken by Owen only in the northeastern part of Minnesota.

The statement has been made that probably "most species of *Ædes* are potential vectors of the virus just as most Anopheles mosquitoes are potential vectors of malaria." Of upwards of two hundred species of Anopheles, a number have been found incapable of maturing the parasite and only about one out of seven of the species is considered of importance as a carrier of malaria. It is too early to make a blanket statement covering the 500 species of the genus *Ædes* because ten species have proved to be capable of transmitting the infection under laboratory conditions.

The mosquito fauna of Minnesota includes twenty-three species of *Ædes*. Of these *Ædes vexans* comes the nearest to meeting the requirements of a good vector of equine encephalomyelitis. It occurs at times in enormous numbers; it viciously attacks both man and animals and individual specimens may live for upwards of three months.

The remaining known potential vectors in our fauna, namely, *triseriatus,* nigromaculis, dorsalis and atropalpus are not sufficiently abundant to play an important rôle in the spread of the infection though they may be responsible for occasional sporadic cases.

Various investigators and most recently Davis, 1940, have attempted to transmit equine encephalomyelitis by the bites of mosquitoes other than Ædes. Davis failed in experiments with *Culex pipiens, Culex salinarius, Anopheles punctipennis* and *Mansonia perturbens.* In the case of the Culex mosquitoes the virus disappeared in two or at most in three days but in *Anopheles punctipennis* it persisted as long as the insects were alive.

In the above discussion no reference has been made to the eastern as contrasted with the western strain in the virus for the evidence indicates that an effective vector can transmit either strain. Moreover, the opinion of Records and Vawter, 1935, that differences between the two types may be only different degrees of virulence, seems supported by the discovery of cases of the so-called eastern strain occurring in Alabama and in Texas. The old idea that there was a sharp line of demarcation in the Appalachian chain of mountains has been disproved.

In an informal report by Dr. Chesley, of the State Department of Health, the statement was made that several of the Minnesota cases reported this year had occurred during the winter. It was not indicated that serological tests were made which demonstrated that these were cases of the equine encephalomyelitis type. If so, it would have a bearing on the problem of insect transmission, comparable to the studies of Kling and Lavaditi on poliomyelitis in Sweden during the winter.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

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ENCEPHALITIS

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THIS summer an unusual number of cases of encephalitis have been reported in Minnesota and North Dakota. Epidemics of encephalitis occurring in the summer months have only been recognized and thoroughly studied during the past decade in the United States. The summer types of encephalitis differ markedly from the form of encephalitis prevalent during the early 1920's. Two types of summer encephalitis have been established on an etiologic basis in this country. The St. Louis type was first recognized in St. Louis in 1933 at which time its etiology was established by the isolation of a filterable virus, and the clinical, pathological and epidemiological aspects of the disease were thoroughly studied. The type of encephalitis due to the virus of equine encephalomyelitis is represented by two forms: (1) The eastern, characterized by a high fatality rate, a predilection for children, and by sequelæ in the survivor; and (2) the western, which, while affecting all age groups and both sexes, tends to affect older people and males, has a lower mortality and sequelæ appear to be rare.

The virus of the western type of equine encephalomyelitis was first isolated from the horse in 1930 and is the etiologic agent of the horse disease prevalent in this area a few years ago. The eastern strain was first isolated from the horse in 1933. The terms "eastern" and "western" refer to the geographical distribution of the disease in horses with the Appalachian Mountains as the line of demarcation. Recently the eastern virus has been isolated from a horse in Texas and in the future the above terminology may lose its significance.

A brief epidemiological and clinical account will be given of the human disease caused by the western form of equine encephalomyelitis virus, since it appears to be the most prevalent type of acute encephalitis in this area at this time. Cases have been recognized in 1937, 1938 and this summer. Cases of the St. Louis type have been recognized through laboratory procedure but clinically they are not distinguishable from the equine type.

The manner of spread in the equine type has not been conclusively established. Contact infection does not appear or appears only exceptionally under laboratory conditions. The disease in both horses and human beings appears at widely separated points simultaneously. Sporadic cases are the rule in human beings and often occur among horses. Cases among relatives and attendants of patients have not been reported, though an occasional associated case can be expected by chance alone with any method of transmission. Sera of contacts and attendants of cases rarely show any protective power. The disease disappears with the onset of cold weather.

These facts are difficult to explain by contact infection and may be more readily accounted for by insect vectors. Mosquito transmission has been most thoroughly studied and ten varieties of aedes mosquitoes have been shown to transmit the eastern or western strains under laboratory conditions. No infected mosquito has been found under natural conditions. Professor W. A. Riley has discussed this subject in the August issue of MINNESOTA MEDICINE.

Insect transmission brings up the question of a reservoir host. The horse does not seem to

be a suitable reservoir since the virus can be isolated only early in the disease and a chronic carrier state has not been established. A wide variety of animals, including birds, are susceptible to infection. Pheasants and pigeons have been found infected under natural conditions with the eastern type of virus. With the exception of the horse no animal has been definitely shown to harbor the western strain of virus; inconclusive evidence of infection of the gopher (Citellus richardsoni) with the western strain has been presented. Despite our imperfect knowledge of spread in this disease, insect transmission explains the known facts better than any other method of spread.

The incubation period of the disease in human beings is not definitely known. Two laboratory infections have been reported. In one, onset was ten days after starting work with the virus and in the other, onset was fourteen days after being sprayed with a virus suspension. The onset of the disease is usually quite sudden, with headache, fever and malaise. Chills or chilly sensations appear quite frequently. In one to two days, occasionally longer, the patient usually feels sick enough to stay in bed and at this time drowsiness and fever are the most pronounced symptoms. In severe cases the fever usually continues to rise and stupor or coma appear. There may be a period of marked restlessness. In cases of any severity, the patient is mentally confused. The only common physical findings are moderate stiffness of the neck and tremor of the lips, tongue and hands. Some report quite frequent absence of the abdominal reflexes. The only laboratory finding of note is an increased spinal fluid cell count. The increase is usually moderate, 30 to 400, with lymphocytes usually predominating. The acute illness lasts ten to fourteen days as a rule. Convalescence may be prolonged because of a feeling of weakness. Recovery is usually complete. Sequelæ appear to be unusual and have been reported chiefly in children in whom severe mental retardation and paralysis may occur.

In diagnosis other acute infections of the central nervous system must be borne in mind. Tuberculous meningitis in older people perhaps simulates this type of encephalitis most closely. Cerebrovascular accident may simulate this disease somewhat. Systemic infections such as typhoid, tularemia, undulant fever and other bacteriemias may have a somewhat similar onset but the subsequent courses of those diseases differ.

Briefly, in this disease there is sudden onset with severe headache and fever followed by marked drowsiness. On examining the patient, moderate stiffness of the neck is noted. Examination of the spinal fluid shows a moderate increase in the cell count. The fatality is not accurately known; figures varying between 7 and 20 per cent have been reported.

An etiologic diagnosis can be made in many cases by the neutralization test. Antibodies appear as early as seven days after the onset. To date, antibodies against the western strain of virus have been found rarely in sera from people with no history of encephalitis, so that a positive neutralization test with a clinical history of encephalitis justifies a diagnosis of encephalitis of the equine type. Isolation of virus from the spinal fluid and blood have each been reported once only.

A positive neutralization test with the St. Louis virus is quite frequently found among normal individuals in an area where the disease is present, and in a doubtful clinical case a diagnosis of the St. Louis type of encephalitis would not be justified unless a blood specimen secured early in the disease showed no neutralization. Not infrequently in the California and Washington cases neutralization of both the equine and St. Louis viruses has been obtained with sera from human cases of encephalitis. In some cases it is thought that previous exposure to the St. Louis virus may explain its neutralization but in other cases it has been suggested that actual mixed infection has occurred. Such an explanation in two comparatively uncommon diseases requires further evidence before acceptance.

To complicate matters further, Cox and associates have reported the horse to be susceptible to infection with the St. Louis virus and presented good evidence that a 1940 outbreak among both horses and human beings was due to this type of virus.

In Minnesota this year an attempt is being made to secure blood specimens from each frank or suspected case of encephalitis both in the acute and the convalescent stages. Neutralization tests are being run with the western strain of equine encephalomyelitis virus and with the St. Louis virus. A great number of blood specimens have

been sent in and of necessity there will be some delay in reporting results on examinations owing to the limitation of the laboratory staff and facilities.

Attempts are being made to isolate the virus from brain specimens. When specimens are sent in, basal ganglia and the brain stem preserved in 50 per cent glycerine, preferably buffered with Locke's solution or with nutrient broth, and iced, should be sent.

There is at present no specific therapy; some go so far as to be very skeptical of the possibility of such therapy being perfected, since it has been shown that antibodies are developed rapidly and can be found in large amounts in fatal cases. There are conflicting reports on the serum therapy of experimental infections. No vaccine has been available for general use. Laboratory workers at biological houses have been vaccinated with relatively crude vaccines given intramuscularly. Its use is said to be painful. There appears to be no reason why a safe vaccine cannot be devised. There has been no great demand for such vaccine in the past because the incidence of the disease has been very low.

The State Department of Health has been requiring quarantine since it is felt that such precautions should be carried out until more is known regarding the mode of spread of infection and methods of exact diagnosis are improved. There is the possibility of the occurrence of the St. Louis type in which there is much more evidence for contact spread than for insect transmission.

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NEW DEVELOPMENTS IN THE DIAGNOSIS AND TREATMENT OF BRUCELLOSIS (UNDULANT FEVER)*

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THE past decade has witnessed a remarkable advance in our knowledge of the incidence of brucellosis. The author's prediction,[107] in 1930, that brucellosis would probably soon become recognized as a public health problem of major proportions, was based upon the discovery of ninety cases of the disease in and about Dayton during a period of eighteen months. Prior to this investigation the disease was not known to be prevalent in this area. The results of other surveys conducted during recent years in widely separated parts of the United States provide unmistakable evidence of the widespread distribution of brucellosis and leave little doubt that this disease is a common and a frequently unrecognized source of disabling illness.

That milk-borne brucellosis may be practically eliminated from a community by the adoption of a universal pasteurization ordinance is demonstrated by the Dayton experience. During the four years prior to the passage of such an ordinance in Dayton, in 1931, 196 cases of brucellosis were encountered. All but one of the fifty-two cases studied by the author during the past decade have occurred in persons who consumed raw milk or unpasteurized dairy products elsewhere, usually while vacationing, prior to the onset of illness. The single exception was an employe of a local dairy who drank milk before it was pasteurized.

Prior to 1926, the sporadic cases which were encountered were regarded as clinical curiosities. Most of these were related to endemic foci of

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goat infection in Texas, New Mexico, and Arizona. From 1927 to 1930, the number of recorded cases rose from 217 to 1,385. During 1929, cases of brucellosis were encountered in every state of the Union. During the eleven years from 1927 to 1938, 794 cases of brucellosis, with sixteen deaths, were officially reported to the Division of Preventable Diseases of the Minnesota Department of Health.[112] In 1940, 3,358 cases were officially reported to the U. S. Public Health Service by State Health Departments.[31] It is undoubtedly true that the number of cases actually occurring in Minnesota as well as in the other States of the Union is much larger than official records would indicate.

Among urban populations, the chief mode of transmission of the disease is by the ingestion of raw milk and unpasteurized dairy products derived from cattle infected with Brucella abortus. Of the 248 patients with brucellosis studied personally by the writer, the ingestion of raw milk or unpasteurized dairy products containing the organism of contagious abortion of cattle was demonstrated to be the source of infection in the great majority of instances. Direct dermal transmission may be the mode of infection among dairymen, veterinarians or slaughter house workers. Hardy expresses the belief that direct contact with infected cattle and hogs has been responsible for a great number of cases of brucellosis occurring in Iowa. Kabler and MacLanahan[65] reported in 1936 that Brucella strains isolated from human cases in Minnesota showed twice as many to be of porcine origin as of bovine origin. This would seem to indicate that the hog is a common source of brucellosis in human beings in Minnesota. It is well to recall, however, that the porcine strain of Brucella has been recovered frequently from cow's milk. Hardy[55] has demonstrated by animal experiments that the skin may act as the portal of entry of the organism. Morales-Otero,[85] of Puerto Rico, has reproduced the disease in human volunteers by inoculations through abraded skin. It is apparent, therefore, that there are two important sources of infection for man: commonly by the ingestion of raw milk or unpastuerized dairy products containing Brucella, or less frequently as the result of direct contact with infected fresh animal tissues or discharges. There is no definite evidence of man-to-man transmission of the disease.

Clinical Manifestations in Man

Because brucellosis presents many symptoms and signs common to typhoid fever, malaria, tuberculosis and influenza, it is frequently confused with these diseases. Many physicians have arrived at a tardy diagnosis of brucellosis only after repeated negative Widal reactions, the failure to demonstrate the malarial plasmodium, and the inability to elicit physical signs or x-ray evidence of tuberculosis. Less often, the disease has been confused with acute rheumatic fever, subacute bacterial endocarditis, bronchitis, pyelitis, appendicitis, cholecystitis, or tularemia.

Symptomatology

As knowledge of the clinical manifestations of brucellosis has advanced, particularly during the past decade, it has become more and more apparent that the older text book descriptions of the symptomatology of the disease were based largely upon experiences with brucellosis of goat origin. The classical clinical picture of a disease characterized by an undulatory, remittent, or intermittent fever, drenching sweats, chills, headache, backache, muscular and joint pains, weakness, loss of weight, possibly a palpable spleen, an infrequent skin eruption, leucopenia with lymphocytosis, and secondary anemia, pertains chiefly to the severe acute forms of the disease. In a high proportion of cases, the disease pursues a relatively mild, prolonged course, extending over many months or years. The early descriptions by Hughes[62] and Craig[25] included many such cases. Alice Evans and others have more recently directed particular attention to the common chronic ambulatory form of brucellosis, in which the patient, whose spirits are already depressed by continued ill health, is often given further discouragement when a diagnosis of neurasthenia is made. Many "neurasthenics," whose chief complaints were exhaustion, insomnia, irritability, and a variety of aches and pains have been found to be victims of chronic brucellosis.

Since the symptomatology of the acute and the chronic forms of brucellosis varies so greatly, these two manifestations will be considered separately.

Acute Brucellosis

The incubation period has been found to vary from five days to longer than one month. In

accidental laboratory infections the incubation period has varied from ten to twenty days. The prodrome is not unlike that of any general infection, with a gradual onset, although in occasional cases the disease is initiated with a sharp chill and rapid elevation of temperature to 103-105 F. (39.4-40.6 C.). A sense of tiredness and weakness, loss of appetite, constipation, headache and backache are common early symptoms. Usually, the patient becomes gradually aware of an afternoon or evening rise in temperature, associated with chills or chilly sensations, nocturnal perspiration and weakness. The patient often feels quite well during the morning hours, particularly in the early stages of the infection. As the temperature rises, during the afternoon or evening, the symptoms gradually return and increase in severity. The nocturnal exacerbations of fever occasionally reach great heights (106-107 F.; 41.1-41.7 C.). There is often a remarkable disparity between the subjective sense of fever and the height of the fever as registered by the clinical thermometer; in many instances the patient does not complain of fever, nor does he present a febrile appearance, but the physician finds, to his surprise, a fever of 101-103 F. (38.3-39.4 C.). As the fever abates, chills and sweating occur. If defervescence is rapid, the perspiration is more likely to be of a drenching character. In such cases, the sweats, which literally saturate the night clothing and bedding, are one of the most impressive features of the disease. The perspiration often has a peculiar sweetish, fetid odor. The chills may be severe enough to be regarded as true rigors in about one-third of the acute cases.[56,107,109] Many patients experience only mild chilly sensations, while in about one-fourth of cases chilliness is absent.

Arthralgia and muscular pains are prominent features of the acute form of the disease in approximately one-half of the cases. The joint pains may be more pronounced during the onset or they may persist throughout the course of illness. The myalgia may be accompanied by a feeling of "stiffness" not unlike the muscular soreness which follows vigorous exercise. Hydrarthrosis and transient periarticular swelling have been observed occasionally. Green and Freyberg[49] investigated the incidence of brucellosis in patients with rheumatic disease. They found that while *temporary* non-purulent joint inflammation does occur, chronic arthritis rarely, if ever, occurs as a complication of brucellosis. We have encountered no instances of permanent joint impairment. Suppurative osteomyelitis as a complication of brucellosis has been described with increasing frequency during the past few years.[5,63,70,71,74,99,101,111,120] In most of the reported cases the vertebræ, particularly in the lumbar region, were attacked. In some instances other bones, such as the humerus, femur, skull, and ribs, were affected. Feldman and Olson[36,37] found similar examples of Brucella spondylitis in twenty-four hogs, an average occurrence of one in every 6,000 swine slaughtered.

Marked restlessness and insomnia usually accompany the nocturnal febrile exacerbations. Delirium occurs in some cases in which the fever reaches great heights. Regional Brucella localizations in the brain, spinal cord or meninges may occur during the acute phase of the disease and produce symptoms and signs of encephalitis, myelitis or meningitis; such complications are, however, more commonly observed as delayed manifestations of brucellosis. The meningeal involvement predominates, and the development of encephalitis or myelitis, or both, is usually secondary to the meningitis. The involvement of the central nervous system may produce the first and only symptoms of the disease. The symptomatology varies greatly, depending upon the extent of meningeal invasion and the presence of additional complications involving the brain, spinal cord or peripheral nerves. In a patient with brucellosis, the development of such symptoms and signs as severe headache, vertigo, diplopia, nuchal rigidity, asphasia, psychic disturbances and various forms of paralysis which are often evanescent, calls for examination of the cerebrospinal fluid. Characteristically, the spinal fluid will be under increased pressure and will show pleocytosis, increase of albumin and a decrease of globulin and sugar. Since the ultimate diagnosis during life depends upon the isolation and identification of Brucella from the spinal fluid, a particularly diligent effort should be made to recover the organism by culture and by guinea pig inoculation. DeJong[27] has recorded eleven verified cases of Brucella meningitis or meningoencephalitis in which the organism was recovered from the spinal fluid by culture or by guinea pig inoculation.

A growing body of evidence indicates that ocular complications of brucellosis are not uncom-

mon. We have encountered at least eight instances of ocular disease occurring as a manifestation of brucellosis. Green[46] has found that the cornea, the uveal tract, the retina, the optic nerve and the external ocular muscles are vulnerable to attack. In addition to four cases (corneal ulcer, retinitis, optic neuritis and central retinochoroiditis) encountered in his own practice, Green describes twenty-seven additional cases reported in the literature. Rutherford[103] found papilledema in three of sixty-three cases of brucellosis examined ophthalmoscopically. Rutherford suggests inclusion of brucellosis in the differential diagnosis in cases of papilledema in which the symptomatology is indefinite. Ruedemann[102] states that brucellosis is responsible for uveitis much more commonly than is generally believed; he found brucellosis to be responsible for chronic uveitis in seven of 125 patients with uveal tract disease.

The matutinal remissions or intermissions and the nocturnal exacerbations of fever may last from one week to many months. The inadequate name "undulant fever" refers to recurring relapses of fever following afebrile intermissions. Such febrile relapses are the exception rather than the rule; most patients experience but one febrile period, lasting from a few days to several months, and finally reaching the normal level by lysis.

The essential gastro-intestinal complaints are anorexia and constipation. The degree of constipation appears often to parallel the severity of the infection. Diarrhea is of rare occurrence. Nausea and vomiting may occur in the more severe cases. Abdominal pain is a not infrequent feature of the disease during its early manifestations. Among 125 cases studied by Hardy, abdominal pain occurred in forty; in ten it was the major complaint. Simpson found abdominal pain to be the chief complaint in sixteen of 142 patients with brucellosis. The occurrence of abdominal pain has often led to appendicectomy in patients with unsuspected brucellosis, the correct diagnosis having been made only after the persistence of febrile symptoms stimulated a further search for the cause. As in typhoid fever, the gall bladder may become a focus of Brucella infection. Brucella has been recovered from the excised gall bladder and from the bile following duodenal drainage in patients with symptoms of cholecystitis.[2,18,79]

Symptoms referable to the respiratory tract may be an outstanding feature of the disease in certain instances. Cough, associated with mucoid or mucopurulent sputum production, is not infrequent during the first few weeks of illness, and may persist for months. Recent reports[8,16,64,72,92] provide convincing evidence that pulmonary lesions of brucellosis are of frequent occurrence and are often detectable by roentgenographic examination, even in the absence of distinctive physical signs of pneumonia. The lesions most often encountered on x-ray examination are peribronchial infiltrations, hilar infiltrations, and scattered discrete or confluent patchy pneumonic areas. The pulmonary manifestations of brucellosis should be regarded as hematogenous lobular pneumonia rather than true bronchopneumonia. Without doubt, pulmonary lesions occur much more commonly than is generally realized. Serial roentgenographic studies will often provide an explanation for vague respiratory symptoms.

The most serious cardiovascular complication has been the occasional occurrence of vegetative endocarditis. Smith and Curtis[110] found reports of nine cases of Brucella endocarditis confirmed by postmortem examination, to which they added a similar case. In most instances the vegetations occurred on mitral or aortic valves previously damaged by rheumatic fever.

The name commonly applied to brucellosis of cattle, "infectious abortion," is derived from the well known predilection of the causative organism for the genital tract. There is strong evidence that the same regional localization sometimes occurs in human beings. Painful swelling of the testes has been described frequently. Acute epididymitis, orchitis, prostatitis and seminal vesiculitis may be early manifestations of the disease. Simpson[109] recovered Brucella abortus from a draining sinus tract which extended from the globus major of the epididymis through the scrotal wall.

There appears to be little doubt that brucellosis is at least an occasional cause of abortion in women who live on farms where they have direct contact with infected animals, or in women who consume raw milk or unpasteurized dairy products. There are reports[26,54,73,105] of human abortion in which the history and serologic findings provide strong circumstantial evidence of the etiologic rôle of Brucella. In a study of 565

cases of brucellosis, Calder[20] found a history of one or more miscarriages in 32 per cent of the married women; a history of one miscarriage followed by sterility was common; a few women reported as many as five or six abortions. More direct evidence has been provided by Carpenter and Boak,[23] who recovered Brucella abortus from the tissues of a human fetus which was aborted at the end of the fourth month of gestation. Kristensen[69] isolated the abortus variety of the organism from the exudate which covered the uterine site of the placenta of a seven-month fetus. Frei[43] isolated Brucella from the vaginal discharge of a woman who had aborted ten days previously.

Loss of weight is an almost constant feature of the acute form of the disease. The greatest loss, often from ten to fifty pounds, occurs in those patients who experience high fever, drenching sweats and great prostation.

A transient cutaneous eruption, usually papular, macular or maculopapular, is a relatively infrequent finding. The skin lesions may simulate the roseola of typhoid fever.

Chronic Brucellosis

Many physicians feel that the symptoms and signs of acute brucellosis are often sufficiently characteristic to justify such a provisional diagnosis on the basis of clinical findings. In dealing with chronic brucellosis, however, the physician is often faced with a problem which will tax his diagnostic acumen to the utmost. No disease, not excepting syphilis and tuberculosis, is more protean in its manifestations.

Quite naturally, a certain amount of wholesome skepticism has arisen in the minds of some physicians regarding any wide prevalence of chronic brucellosis. Such a feeling of doubt is quite defensible, since one is justified in questioning the validity of some of the diagnostic tests upon which such a diagnosis is often based.

The common and unfortunate employment of the name "undulant fever" has served only to add further difficulties in the recognition of cases of chronic brucellosis. A significant temperature curve, physical signs of disease, and positive agglutination tests and skin tests may be entirely lacking throughout a long period of chronic illness. The recent studies by Evans,[32,33,34] Poston,[95] Angle,[3] Scoville,[104] Thames,[115] Calder,[20] Hamman and Wainwright,[53] Harris,[57] Cameron and Wells,[22] Gould and Huddleson,[47] Gersh and Mugrage,[45] and Angle, Algie, Baumgartner and Lunsford[4] leave little doubt that a protracted, relatively mild, partially disabling, often ambulatory, form of brucellosis is widely prevalent and constitutes a major cause of chronic ill health. Only a small proportion of patients with chronic brucellosis, probably less than 10 per cent, have experienced a previous acute febrile illness, compatible with a diagnosis of acute brucellosis. In many cases the patient is not entirely incapacitated for work, but complains chiefly of weakness and exhaustion, with or without mild fever. Since the commonly employed diagnostic tests are frequently negative in such cases, and since even the most conscientious physician may not find physical abnormalities to account for the patient's complaints, the almost inevitable diagnosis of neurasthenia or psychoneurosis is too often made.

A recitation of all of the symptoms which have been ascribed to chronic brucellosis would serve only to heighten the confusion which as yet surrounds this baffling phase of the disease. In general, it may be stated that the three cardinal features of most cases of chronic brucellosis are weakness, low-grade fever and a lack of objective physical findings. McGinty and Gambrell[78] have listed over 150 different manifestations of chronic brucellosis. Mild degrees of fever may be present for many weeks or months; there may be several months of complete freedom from fever; sudden febrile exacerbations may occur, accompanied by an accentuation of the prevailing symptoms, or by the development of evidence of new regional symptoms affecting the respiratory, cardiovascular, genito-urinary, gastro-intestinal, skeletal or nervous systems. Pneumonia, endocarditis, orchitis, epididymitis, prostatitis, oöphoritis, cholecystitis, hydrarthrosis, arthritis, spondylitis, osteomyelitis, ocular complications or meningo-encephalitis may be associated with the acute form of the disease, but much more commonly appear several months, or even years, after the often indefinite onset of the chronic form of brucellosis. In some instances such delayed evidences of regional Brucella localization may appear long after apparent recovery from the acute manifestations of the disease. All students of chronic brucellosis have emphasized the almost universal prominence of symptoms which relate to the central nervous sys-

tem. In addition to the occasional acute invasion of the meninges, brain and spinal cord by Brucella, there is evidence[34] that the endo-antigen of Brucella organisms circulating in the blood has a toxic action upon the central nervous system. Such observations led Evans[32] to state: "These facts challenge the right of a physician to make a diagnosis of neurasthenia—a diagnosis regarded as dishonorable by the patient, and also by his family, his employer and his friends—without considering, among other possibilities, the possibility of chronic brucellosis."

Chronic brucellosis should be suspected in all cases of so-called "fever of unknown origin," There are many reports of the isolation of Brucella from the blood, urine, bile or from extirpated tissues in patients who have experienced unexplained, long-continued, low-grade fever for years. Hamman and Wainwright[53] re-examined thirty-six such patients; an accurate diagnosis was finally made on ten of them; three were found to have brucellosis.

Diagnosis

Since it is hazardous to base a diagnosis of brucellosis solely on clinical grounds, recourse must be had to laboratory diagnostic tests. These procedures include *(a)* primary isolation of the causal organism by cultural methods from blood, spinal fluid, secretions, excretions, or excised tissues; *(b)* indirect recovery of Brucella by culture after animal inoculation; *(c)* the agglutination test; *(d)* the intradermal test; and *(e)* the opsonocytophagic reaction.

The only method by which the diagnosis of brucellosis may be completely established is by the *cultivation and identification of the organism.* While cultural techniques have improved greatly during the past few years, with a corresponding increase in the number of reported instances of recovery of the organism, the undertaking is often beset with difficulties and requires skill and, above all, patience. The melitensis and suis varieties of Brucella ordinarily grow readily under aerobic conditions, while the much more commonly encountered abortus variety requires an atmosphere containing 10 per cent carbon dioxide.

The most commonly used and the most reliable indicator of Brucella infection, in the absence of positive cultures, is the *agglutination test.* This is particularly true in cases of acute brucellosis, in which a high serum agglutinin titer will be found in a great majority of cases. Agglutinins may appear as early as the fifth day of illness, but ordinarily are not found until the second week after the onset. In some instances, specific agglutinins may not appear for several weeks. One important source of difficulty in interpreting the results of agglutination tests is the fact that agglutinins may be persistently absent or may be present in low titer in persons from whom Brucella has been cultivated. Another source of error in interpreting the agglutination reaction is the fact that the titer may remain at a high level for months or years after recovery. Then, too, some individuals exposed to the infection may develop agglutinins without notable illness. Furthermore, the level of the agglutinin titer may fluctuate widely on repeated testing. *These considerations call for the exercise of keen judgment in interpreting the results of the agglutination test. A person suffering from some disease other than brucellosis may have a positive agglutination test merely as the result of a previous symptomatic or asymptomatic Brucella infection.*

In the past, diagnostic significance has usually been attributed to titers of 1:80 or above. The choice of such an arbitrary diagnostic titer is not justified in the light of recent studies. In those cases in which the clinical manifestations suggest brucellosis, the absence of agglutinins or their presence in titers of 1:10 to 1:40 should stimulate further bacteriologic and serologic studies.

While the agglutination test is undoubtedly of great value, its limitations must be recognized. Otherwise, errors will be made in two directions: first, the correct diagnosis of brucellosis may not be made because too much reliance is placed on a negative test; or second, an incorrect diagnosis of brucellosis may be made in a person who has a residual agglutinin titer from a previous invasion by Brucella, but who is suffering from some other disease when the test is made.

The *intradermal* test is used to determine cutaneous hypersensitiveness to specific Brucella antigen. A positive allergic skin reaction is generally accepted as evidence of past or present invasion of tissues by Brucella. While the great majority of patients from whose blood Brucella has been recovered show a positive skin test, the test has yielded negative results in rare in-

stances in which Brucella infection was proved by culture.

The chief sources of error in interpreting the significance of a positive skin test lie in the fact that the test is frequently positive in exposed individuals with no history of an illness compatible with brucellosis. Furthermore, the hypersensitiveness, once acquired after symptomatic or subclinical infection, usually persists for many years. *Therefore, it must be emphasized that a positive skin test does not mean that the symptoms from which the patient is suffering at the time of a positive skin test are necessarily due to brucellosis.* Students of this disease are only too familiar with instances in which a diagnosis of brucellosis was made only on the basis of a positive skin test and in which further developments revealed the presence of some such disease as active tuberculosis, Hodgkin's disease, leukemia, typhoid fever, malaria, or subacute streptococcic endocarditis. Gould and Huddleson,[47] regard the skin test as the most sensitive diagnostic test for brucellosis; these investigators express the belief that if the skin test is negative, brucellosis may usually be ruled out.

There is evidence[28,46] that the injection of heat-killed Brucella for the intradermal test stimulates the production of agglutinins. Evans[34] found that the intracutaneous injection of brucellergin in twelve volunteers caused the development of opsonins in seven and agglutinins in five; in one instance the agglutinins rose from zero to a titer of 1:320. *Hence, blood specimens for serologic tests should be collected before the intradermal test is performed.*

The inadequacies of the agglutination test and the intradermal test, particularly in distinguishing between present and past Brucella infection, led Huddleson, Johnson and Hamann[61] to reintroduce the *opsonocytophagic reaction,* a modification of the Leishman-Veitch technique for determining the phagocytic activity of the blood in the presence of serum opsonins and homologous leukocytes. The opsonocytophagic test is employed in conjunction with the intradermal test or the agglutination test, or both, to determine the immunity status of an individual giving positive tests by either or both methods. The test is performed by mixing 0.1 c.c. of the patient's citrated blood with 0.1 c.c. of a saline suspension of living Brucella which have been grown for forty-eight hours on liver infusion agar. The suspension should contain at least six billion organisms per c.c. of physiologic saline solution (pH 7.0). The mixture is then incubated at 37 C. (98.6 F.) for thirty minutes, after which a small amount of the sedimented cells is removed with a capillary pipette. A smear is then made from a large drop of the cell suspension, dried rapidly and stained with Hasting's stain or Bordet-Gengou's carbol toluidin blue. The number of bacteria in twenty-five polymorphonuclear neutrophilic leukocytes is determined and classified according to the number of bacteria per polymorphonuclear leukocyte; the absence of phagocytosis indicates a negative result; 1 to 20 phagocytized bacteria indicates slight, 21 to 40 moderate, and 41 or more, marked phagocytosis.

According to Huddleson's interpretation, the opsonocytophagic power of the blood is low during the active infective phase of the disease and becomes marked after recovery. On this basis, it is considered that individuals have developed immunity to Brucella if 60 per cent or more of the polymorphonuclear leukocytes show marked phagocytosis. If as many as 40 per cent of the leukocytes show moderate to marked phagocytosis the patient may be infected and has not yet developed any immunity, or he may be uninfected.

While theoretical considerations lend support to the contentions of Huddleson and his associates as to the value of the opsonocytophagic test, it still lacks confirmation. The studies by Calder,[20] and Keller, Pharris and Gaub,[66,67] appear to provide some support to Huddleson's thesis. On the other hand, Evans[35] regards the opsonocytophagic test as the least reliable of the diagnostic tests in cases of chronic brucellosis; she found strongly positive (immune) reactions in four cases from which Brucella were cultivated, and weak or moderate reactions in recovered cases. Morales-Otero and Gonzales[86] tested over 200 individuals (cattle handlers, milkers and laboratory workers exposed to Brucella infection) with a purified Brucella skin-test antigen, agglutination tests, complement fixation tests and opsonocytophagic tests. They found no correlation between cutaneous allergy to Brucella and the opsonocytophagic reaction. Fifteen cases that were positive to the opsonocytophagic reaction gave a negative cutaneous reaction, while eighteen showing a positive cutaneous reaction were completely negative to the opsonocytophagic

reaction. Lee Foshay[38,39] and the writer, working independently, have found that a significant proportion of patients yield aberrant and unexpected results in relation to their immunity status when the opsonocytophagic test is employed in conjunction with cultural methods, agglutination tests and skin tests. High phagocytic titers (immune reactions) occur in some patients with severe and uninterrupted brucellosis, proved by cultures. Certain recovered patients, asymptomatic for months or years, exhibit marked fluctuations from month to month, running the entire gamut from high to low phagocytosis, or sometimes none at all. *Until more extensive studies have been made on culturally proved cases of brucellosis the results of the opsonocytophagic test should be interpreted with caution and with reservations.*

Hematocytologic studies indicate that leukopenia occurs in the majority of patients with acute brucellosis. In chronic brucellosis, either leukopenia, moderate leukocytosis or normal leukocyte levels may be found. Calder[21] has directed particular attention to the occurrence of active lymphocytogenesis as the most striking and constant feature of the blood picture in all of the manifestations of brucellosis. The lymphocytosis is evidenced by an increase in both percentage values and in absolute number of lymphocytes and by an unusually high proportion of immature lymphocytes (lymphocytic shift-to-the-left). Mild anemia of the macrocytic, hyperchromic type is the rule. The erythrocyte sedimentation rate is usually not high, except when complications such as arthritis are present. Calder expresses the belief that this combination of white blood cell and red blood cell abnormalities is distinctive for brucellosis and provides an additional confirmatory diagnostic aid.

Prognosis

Fatal outcome is rare, having occurred in about 2 per cent of reported cases. During 1936, 107 deaths from brucellosis were officially recorded in the United States. The importance of the disease is not to be judged by the low mortality rate. The prolonged course and the resulting chronic ill health in a high proportion of cases make the outlook much more serious than the death rate would indicate. Death is usually the result of overwhelming acute infection, terminating fatally during the first few weeks of illness, or it follows a relapse at any stage of the disease due to regional localizations of Brucella in such structures as the meninges, brain, heart valves or lungs.

Treatment

The most important consideration in the control of brucellosis is *prophylaxis.* The widespread distribution of the infection among cattle renders it difficult to control the infection at its source. Many cows have Bang's disease and eliminate the organisms in large numbers in the milk and vaginal discharges without manifesting symptoms of the disease (abortion, mastitis, sterility and lessened milk yield).

Since 1934, the United States Department of Agriculture has been engaged in a laudable campaign directed toward eradication of brucellosis in cattle. After fifty-five months of diligent effort, ending January 31, 1939, more than a million and a half cattle (approximately 5.5 per cent of the number tested) were found to give positive tests for brucellosis; the infected cattle were condemned and the farmers and dairymen received indemnities to compensate for the loss of the cattle. Unfortunately, no similar campaign has yet been inaugurated to control the disease in hogs and goats.

There is but one logical method for preventing the transmission of milk-borne infection to human beings, and that is by pasteurization. Brucellosis is only one of the formidable list of diseases transmitted to man through the use of raw milk and other unpasteurized dairy products. Murray, McNutt and Purwin,[87] Boak and Carpenter,[15] and Zwick and Wedeman[125] have demonstrated that complete pasteurization [143-145 F. (61.6-62.7 C.) for thirty minutes] will destroy Brucella. *The need for strict supervision of the pasteurization process is apparent.* For the protection of the health of those persons whose occupations bring them in direct contact with infected animal tissues we must rely upon education and the institution of precautionary measures.

For those persons who live on farms, or in small communities where pasteurization is not yet practiced, home pasteurization may be carried out by placing the milk in an aluminum vessel and heating it to 155 F. (68.3 C.), stirring constantly, then immediately setting the vessel in cold water and continuing the stirring until cool.

Prophylactic Immunization

Kolmer, Bondi and Rule[68] have recently reported the apparently successful simultaneous immunization of human beings against both brucellosis and typhoid fever by administering a vaccine composed of 1,000 million heat-killed B. typhosus combined with similar quantities of heat-killed Br. abortus and of Br. melitensis. The vaccine was administered subcutaneously in doses of 0.5, 1 and 1 c.c. at weekly intervals. The vaccination was well borne; the mild reactions were comparable to those following typhoid-paratyphoid vaccine. About 96 per cent of the subjects developed agglutinins for B. typhosus and all developed both agglutinins and immune opsonin for Br. abortus. The serums of about 17 per cent showed some protective antibody for Br. abortus before immunization as compared with 79 per cent after immunization. Similarly, some protective antibody for Br. melitensis was present in 14 per cent of the volunteers before vaccination; after immunization all had protective antibody. Immunization with the vaccine did not appear to produce allergic cutaneous sensitization to brucellergin. These observations would appear to justify more extended trial of this simple method of protection, particularly to those who are exposed to either typhoid or Brucella infection.

Specific Therapy

While there is considerable evidence that the employment of various types of serum therapy and vaccine therapy has greatly improved the outlook for most patients suffering from acute or chronic brucellosis, it is extremely difficult to evaluate the effectiveness of any form of specific therapy in a disease characterized by natural remissions and by an extremely variable symptomatology. The reported results of vaccine therapy or serum therapy run the entire gamut from pessimism to hyperenthusiasm. More extensive controlled and systematic studies on a large number of patients, carried out over a period of many years, are necessary before definite statements can be made. It would appear, however, that sufficient data have been accumulated to justify the continued and extended use of some of the specific agents.

A. Serum Therapy.—Interest in serum therapy, which had waned following the earlier appearance of several unfavorable reports, has been revived by the development of a more potent anti-Brucella serum by Foshay[40,122] and his associates at the University of Cincinnati. Detoxified Brucella antigens are employed for the development of the antiserums in goats and horses. Several favorable experiences with the Foshay serum have been recorded by other workers.[6,24,83,89,123] This type of antiserum therapy should be restricted to patients with acute or subacute brucellosis, preferably to those who have had the disease less than eight months.

B. Vaccine Therapy.—It seems probable that the earlier discrepant reports of the effectiveness of vaccine therapy had their basis in a lack of standardized methods for the preparation of the vaccines, both as regards the choice of suitable strains and the concentration of the vaccine. These difficulties appear to have been largely overcome in recent years by the development of better standards for the preparation of therapeutic vaccines.

Brucella melitensis (varieties abortus and suis) vaccine, N.N.R., has been widely employed and is available through the usual trade sources. This vaccine is a saline suspension of heat-killed or formalin-killed Brucella abortus and suis organisms in equal quantities. Vaccines prepared from the melitensis variety of the organism should be utilized only in the treatment of the relatively rare Brucella melitensis infections.

Experience has taught that no rigidly standardized scheme of dosage of vaccine is applicable to patients with brucellosis. Experience and good judgment are essential requisites in determining the proper dosage for each individual. The usual procedure with the commercially available vaccine is first to test for hypersensitiveness by injecting 0.05 c.c. of a 1:10 dilution of the vaccine intracutaneously. If the patient does not experience an excessive local or systemic reaction within the next forty-eight hours, an initial therapeutic dose of 0.25 c.c. is injected into the deep subcutaneous tissues, or preferably into the muscle. Local reactions are minimized by intramuscular injections. If no untoward reaction follows the first injection of 0.25 c.c., a second dose of 0.25 c.c. is given three days later. The dosage is then increased in increments of 0.25 c.c at intervals of three days, until a dosage of 1 c.c. is reached. Ordinarily, two injections of 0.5 c.c.

and two of 0.75 c.c. are given before the 1 c.c. dosage is attained. Five to eight injections of 1 c.c. each may then be given at three-day intervals.

If the patient is highly sensitized, it is wise to begin with intramuscular doses of 0.1 c.c., or, in rare instances of extreme sensitization, with doses of 0.1 c.c. of a 1:10 to 1:100 dilution of the vaccine, and gradually increase the dosage by 0.1 c.c. increments until a dosage of 1 c.c. is reached. If, during the course of vaccine injections an unusually severe local or systemic reaction should occur it is desirable to reduce the next dose to one-half the amount which produced the severe reaction and then cautiously and gradually increase the succeeding doses.

A series of four to six or more sharp systemic, febrile reactions, usually accompanied by a transient exacerbation of symptoms, is the goal of the treatment. Hence, only extreme local or general reactions should be avoided. Elevations of temperature to 103-105 F. (39.4-40.6 C.) are not uncommon within four to eight hours after the injection of vaccine. Such systemic responses may occur following the first injection of a small quantity of vaccine or may not occur until relatively large doses are given. In chronic brucellosis larger doses of the vaccine may be required; if no reaction is provoked after five or six 1 c.c. injections, the dosage may be gradually increased by 0.5 c.c. increments to 2 or 3 c.c.

While some patients who have obtained an apparently satisfactory response to vaccine therapy have had little or no thermal reaction, the most prompt and lasting results have occurred in those who have experienced several such reactions.

Erythema and tenderness at the site of vaccination occur commonly for a day or two following injections. In about 5 per cent of cases, a local hard tumefaction may persist for much longer periods. In a small proportion of such cases sterile abscesses or local areas of necrosis have developed.

C. Brucellin Therapy.—Brucellin is a fraction of Brucella cells obtained by growing the organism in liver broth. The bacteria-free active agent is recovered from the liver broth filtrate. This preparation was devised by I. F. Huddleson[58,59,60] and may be procured at the Central Brucella Station, Michigan State College, East Lansing, Michigan.

The dosage of Brucellin must also be adjusted to suit the requirements of individual patients. After the extent of sensitiveness has been determined by the intradermal injection of 0.1 c.c. of Brucellin, the usual procedure in non-hypersensitive patients is to give repeated injections of 1 c.c. at intervals of three days until the morning and evening temperatures between the intervals of injection tend to become subnormal. Here again, one object of this form of therapy is the production of a series of four or more febrile, systemic reactions.

A partially oxidized detoxified vaccine, devised by Foshay and O'Neil[90] has been used with apparent success.[29] Much smaller doses are given subcutaneously at more frequent intervals. The few reports of results indicate the recovery rate equals that of other vaccines or Brucellin. Local or constitutional reactions do not occur with the oxidized vaccine. It has been recommended chiefly for the treatment of chronic brucellosis.

While it is difficult to evaluate the results of vaccine or Brucellin therapy, the experiences of many investigators indicate that about 60 per cent of patients with brucellosis obtain apparently complete recovery after a satisfactory course of either agent. An additional 25 per cent appear to obtain some benefit, while the remaining 15 per cent are not improved.

The contra-indications to vaccine or Brucellin therapy are heart disease, renal disease, arteriosclerosis, meningeal or cerebral localizations of Brucella or the acute fulminating (malignant) form of the disease.

Non-Specific Therapy

Non-Specific Protein Therapy.—Injections of foreign protein substances, such as sterile skimmed milk, typhoid vaccine or typhoid-paratyphoid vaccine have been utilized[17,80,84] for the production of nonspecific shock reactions in the treatment of brucellosis. Erwin and Hunt[29,30] reported good results in twenty patients with acute and subacute brucellosis following the intravenous injection of killed typhoid and paratyphoid organisms. The usual initial dose was 30 to 50 million killed organisms, with two to six additional injections, increasing the dosage by increments of 25 million organisms.

Chemotherapy. — Neoarsphenamine, mercuro-

chrome, acriflavine, metaphen, thionin, methylene blue, methyl violet, gentian violet and other chemical substances have been used in the treatment of brucellosis. In most instances the reports of the apparently successful use of these substances were based upon observations limited to small numbers of patients. The very length of the list argues against the specificity of any of them.

Sulfanilamide and related compounds have been heralded[1,7,9,10,11,12,13,41,42,44,50,51,52,75,76,81,82,88,91,93,98,100,106,113,114,116,117,118,119,121] as effective agents in the treatment of brucellosis since 1936. After the first wave of enthusiasm, usually based on short observations on relatively few patients, other reports of less favorable or entirely negative results have appeared. Blumgart and Gilligan[14] analyzed the results reported in the thirty-one papers which appeared between 1936 and 1939. Twenty-four of the reports were concerned with only one or two patients. Of the seventy-four cases treated with sulfanilamide or allied compounds, there were sixty-eight apparent recoveries and six failures; fourteen of the sixty-eight patients (20 per cent) exhibited relapse after apparent recovery. The daily dosage of sulfanilamide employed in most cases was 4 to 6 gm. (60 to 90 grains) during the period of fever, with gradually diminishing dosages for three or four days after the fever abated. The administration of the drug was rarely continued for more than twelve days. Bynum[19] reported six cases of brucellosis unsuccessfully treated with large doses of sulfanilamide. Long and Bliss[77] report recurrence of infection in four of five patients whose immediate response to sulfanilamide therapy was apparently quite satisfactory: in two instances Brucella was recovered from the blood after sulfanilamide therapy was discontinued. The writer has had similarly disappointing experiences in several cases treated with large doses of sulfanilamide, sulfapyridine or sulfathiazole, controlled by quantitative blood levels; in several instances apparent remission occurred only to be followed by relapse. *Until more extensive and extended studies are made on culturally proved cases, the value of sulfanilamide therapy in cases of brucellosis must be regarded as undetermined.* In this connection it might be well to recall the fact that a temporary remission is not synonymous with cure.

Artificial Fever Therapy.—The observation that recovery from brucellosis often followed the induction of fever by chemical or biological agents led Prickman and Popp[96] to investigate the possible usefulness of artificial fever induced by physical means in the management of brucellosis. Each of three patients was given three artificial fever treatments, each of five hours' duration, at a rectal temperature of 105-106 F. (40.6-41.1 C.); all were benefited by the treatment. Zeiter[124] described a similarly favorable experience. More recently, Prickman, Bennett and Krusen[97] analyzed the results of treatment with physically induced hyperpyrexia in twenty-one cases of brucellosis; apparent cure resulted in 80.9 per cent of the patients. The duration of the disease prior to artificial fever therapy varied from ten days to two and one-half years. We[108] have had similar favorable results in refractory patients who have not responded to vaccine therapy; the usual course employed by us has consisted of six fever sessions, each of three hours' duration, at a rectal temperature level of 105 F. (40.6 C.), given during a period of two weeks; the patients were hospitalized during the course of artificial fever treatments. Artificial fever therapy should be carried out only in properly equipped institutions by thoroughly qualified physicians and nurse-technicians.

Summary and Conclusions

1. The author's prediction of a decade ago, greeted with some skepticism at that time, that brucellosis would become recognized as a public health problem of major proportions has been fulfilled. Of the 248 cases of brucellosis studied by the author, all but fifty-two occurred prior to the passage of a universal pasteurization ordinance in 1931. In each of the fifty-two cases occurring during the past ten years the patient had consumed raw milk elsewhere prior to the onset of illness.

2. The symptoms of the acute and the chronic forms of brucellosis varies greatly. The diagnostic criteria for acute brucellosis are usually not applicable to the chronic form of the disease. There is little doubt that the chronic ambulatory form of brucellosis is widely prevalent, is often confused with other diseases, and frequently is not recognized. Many "neurasthenics" and patients with so-called "fever of unknown etiology"

have been found to be victims of chronic brucellosis. Less than 10 per cent of patients with chronic brucellosis have experienced a previous acute febrile illness, compatible with a diagnosis of acute brucellosis.

3. The only diagnostic procedure by which the diagnosis of brucellosis may be established with certainty is by the cultivation and identification of the organism. The agglutination test and skin test are of considerable value in the diagnosis of acute brucellosis, but these procedures are notoriously inadequate as diagnostic aids in cases of chronic brucellosis. A positive agglutination test, particularly of low titer, and a positive skin test do not indicate that the person is suffering from brucellosis at the time the tests are made. Both the agglutination test and the skin test will yield entirely negative results in an appreciable number of persons from whose blood Brucella may be recovered.

4. In our hands, the opsonocytophagic test has yielded a high proportion of inconsistent results. We have found this test to be of little value as a diagnostic procedure or as a guide to therapeutic response.

5. Since it is now well established that brucellosis is caused most frequently by the ingestion of raw milk containing Brucella, the most important consideration in the control of the disease is adequate, controlled pasteurization of all milk and other dairy products.

6. Brucella vaccine therapy has produced favorable results in from 60 to 85 per cent of patients with either acute or chronic brucellosis. Sulfanilamide and other sulfonamide drugs are apparently of little benefit. Artificial fever therapy has yielded favorable results, particularly in those refractory patients who have not responded to vaccine therapy.

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PRESENT-DAY TREATMENT OF COMPOUND FRACTURES*
With an Analysis of Twenty-five Consecutive Cases

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SINCE man first began having accidents, the treatment of compound fractures has, no doubt, challenged the skill of the orthodox as well as the unorthodox surgeon. In accepting the challenge, the surgeon has not only learned means to combat shock and mitigate pain, but he has gone a long way toward mastering the principles underlying reconstruction of broken bones and injured tissues as well as towards coping with fatal infections. While the end-results of present-day treatment still leave much to be desired, fewer people today, surely, in spite of the appalling increase in accidents, suffer crippling deformities and poorly functioning limbs than in former times. Now it is everywhere stressed that compound fractures are emergencies, and that they should be given the same prompt and careful attention accorded to emergency conditions from other causes. And the duration of the interval between the time of trauma and the institution of adequate treatment is regarded as the most important single factor to influence the success or failure of the treatment.

First Aid

It has been stated that treatment of compound fractures properly begins at the scene of the accident.[19,20] Some surgeons[2,11,45] strongly urge that motor policemen, firemen, ambulance drivers, and all others who first handle the patient be taught adequate measures to prevent additional trauma and shock—such measures as application of a tourniquet, covering the wound with sterile gauze, and traction immobilization in a suitable splint. Stevenson[43] warns that no attempt should be made at the scene of accident to cleanse a compound fracture of the skull. Only a simple sterile or alcohol dressing should be placed on the wound, and a tight bandage applied. He warns further that no patient with a "head injury should be moved until a posterior splint has been applied to the spine as well," and that all constricting clothing about the neck should be loosened.

Shock

How much to do or not to do for shock *per se* appears to be a controversial problem. Cubbins and his associates,[11] among others, prefer to treat shock first. They "have made it a standing rule to wait six or eight hours if necessary until the patient has recovered from shock before proceeding further." Other surgeons[2,13,45] are of the opinion that débridement and immobilization should be done promptly even in the presence of shock, unless the shock is of such severity that any treatment except for it is definitely contra-indicated. Orr[36] contends that shock, hemorrhage, and swelling "may be prevented or relieved by immediate reduction and control of the injured parts in correct length and position. With reduction of the fracture there is restoration of circulation and nerve supply; hence all of the physiologic functions in the injured part may be expected to improve," he argues. All authors agree, however, that it is of vital importance to institute treatment at the earliest possible moment. As Thomson[45] explains, "the chances of eliminating infection are reduced with each hour of delay. From six to ten hours after the accident, infection has gained a foothold in the tissues and is hard to combat." Heyl[20] and also Hermann[19] call attention to the necessity of a thorough general examination of

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the patient in order to detect any possible serious injuries less evident than the fracture.

Débridement

Meticulous, yet gentle, débridement is looked upon by most surgeons as an essential procedure in the management of compound fractures. McBride[30] asserts that "débridement does not need to be radical. Only tissues so ragged and macerated as to cause necrosis need be excised." And Heyl, as well as others, feels that débridement should be done within six hours after trauma or not at all.

Individual débridement technics vary more or less. As a rule, however, all foreign material and devitalized tissue are removed. Trauma to healthy tissue is avoided, and careful hemostasis is performed. Sponging by pressure is preferred to wiping. Sutures are avoided as much as possible, and when necessary are of fine catgut, silk, or cotton, and placed without tension. Gloves and instruments are changed frequently. Eloesser[14] points out that "wide incisions into skin and fascia are unimportant and can be repaired perfectly; insufficient ones are very important and will determine future loss of the limb, sepsis, spreading osteomyelitis, gas gangrene and phlegmons of the soft parts."

The use of strong antiseptics is generally condemned. Prolonged irrigation with warm saline solution is the cleansing medium most frequently recommended. In some instances a wash with a mild antiseptic or ether is also added. Cannaday[6] has recently been cleansing wounds with a 3 per cent solution of cocoanut oil soap, followed by irrigation with normal saline. He is of the opinion that this soap solution is distinctly bactericidal. Reynolds et al[39] studied forty-four cases in which the débrided wound was flooded with iodine and alcohol before closing, and forty-four cases in which it was not. Their analysis of these cases showed a greater incidence of infection in the wounds treated with iodine (18.1 per cent as compared with 13.1 per cent). This, they state "is explained on the assumption that the use of iodine resulted in the death of a sufficient number of cells to encourage infection." Eloesser, reporting on "practical experience in the Spanish civil war," makes the comment that "especially noticeable was distrust in chemical antisepsis. Irrigations, Dakin's tubes and the complicated ritual of antisepsis that ornamented military hospitals in 1918 were unused or forgotten. Their place was taken by extensive incisions and plaster-of-Paris splints."

Wound Treatment

Opinions vary widely on the proper management of the wound after débridement. To quote Reynolds et al., "such diversity of opinion not only indicates the lack of an entirely satisfactory method but emphasizes that whatever the method is, it is good in the hands of those who are familiar with its technic." Cannaday advocates primary skin closure with lateral incisions to relieve any undue tension. In a questionnaire sent to about thirty-three men, Cannaday found that the majority favored débridement and primary closure of the wound. This form of wound management is also used in most instances with local implantation of sulfonamides. Sherman[41] and Kreuscher[28] are among those who are partial to sodium hypochlorite solution irrigation of the wound through Carrel tubes. Orr[36,37] proposes open drainage with petrolatum gauze and infrequent dressings.

Reduction and Immobilization

Some men[13,36,45] contend that better results can be obtained if adequate reduction, even in the presence of infection, is carried out immediately after débridement. Orr is of the opinion that reduction of a fracture depends on traction more than any other factor. He advises that sufficient traction be applied at the time of operation, and that skeletal pins, fixed in the plaster-of-Paris cast, be used to maintain length and position.

With regard to internal fixation, all surgeons do not agree. Some take the stand that it is best not to insert a foreign body if it can be avoided. Others favor this procedure in certain cases. Where internal fixation is resorted to, the devices used vary from small screws to large plates, and the metals from which they are fashioned vary too. Sherman describes a new stainless steel which, he states, has all the physical properties of vanadium and will not corrode in the presence of sodium chloride or sodium hypochlorite solutions. In his opinion it is superior to vitallium. Most traumatic surgeons, however, do not concur in this opinion. Venable and Stuck[47] feel that only vitallium thus far is sufficiently passive in body fluids. They are also encouraged by their experiments with 19-15 steel which,

they say, seems to hold promise of a malleable yet passive alloy. Murray,[33,34] who uses a 19-9 chrome nickel stainless steel, emphasizes that the metal selected should be able to stand the strain of active function. He, as well as Berg[1] and others, is of the opinion, however, that the technic is more important than the composition of the metal used. And Thomson expresses the same feeling when he says that the occasional operator on fractures should not attempt internal fixation. According to him, "one who attempts such measures in surgery must be master of the most meticulous surgical technic. Not only must he stock the various sizes and types of plates and screws and have the proper tools with which to handle the fragments, plates, screws, nails, wires and pins but above all things he must have profound experience and knowledge of how to use them."

Rigid postoperative fixation is regarded by most traumatic surgeons as an important factor in subsequent functional activity. The means for assuring adequate external fixation varies from splints of all sorts and different types of traction apparatus to simple plaster casts. Eloesser stresses accurate and careful molding of the plaster cast, and believes that "to pad plaster with absorbent cotton or some such material is to frustrate the purpose of plaster." Some surgeons recommend that plaster casts be adequately fenestered to allow for constant observation of the wound and for dressings. Others frown on such a procedure, maintaining that each time the wound is distributed there is additional danger of infection. Cohen and Schulenberg,[8] who treated 266 men with gunshot wounds of the extremities evacuated from Dunkirk, state that in this group four wounds in which gas was actually present and *B. welchii* was cultured were enclosed in plaster yet gave no cause for anxiety later. They look upon continuous pain and fever with edema of the fingers or toes as reliable signs of inadequate treatment or severe supervening infection. Cohen and Schulenburg also obtained excellent results in 30 soft tissue wounds treated in plaster.

The largest recent series of compound fractures was reported by Trueta[46] who applied the Orr treatment (immediate reduction, open drainage, plaster-of-Paris fixation) to 1,073 patients during the hostilities in Spain. With this treatment he got "good or satisfactory results" in 976 instances and "bad results" in 91. There were six deaths in his series. In a letter to Orr, Trueta wrote that under his insistence the method was put into practice in the army 10,000 times, and that "the gas gangrene that made so many victims suffer at the beginning of the war," had then almost disappeared.[37]

Chemotherapy

Tetanus Injections.—The administration of tetanus antitoxin is universally recommended as a routine prophylactic measure in civil practice. Crossan[10] points out, however, that one prophylactic dose is not enough. He states that he had just had on his "service a second case of tetanus in two years in spite of the fact that the patient had a prophylactic tetanus antitoxin." McKim[31] agrees that a second dose is of value.

Simon and Patey,[42] who observed 14 cases of tetanus among a total of 1,900 wounded, recommend a daily serum dosage of 80,000 to 120,000 units during the first few days, and a lesser amount later. They are of the opinion that sympathetic infiltration is indicated in cases in which peripheral pains or pain in an amputation stump appeared when the tetanus seemed to improve. They treated successfully two patients with pain in a lower extremity stump by infiltration of the lumbar lymphatic system and one patient with pain in an arm stump by infiltration of the stellate ganglion. A total of four to six infiltrations may be given, two a day, and about 20 c.c. of a 1 per cent novocain solution is used for one infiltration.

Now with the advent of widespread war, immunization against tetanus has become of vital importance. Newhouser[35] and others feel that the alum-precipitated tetanus toxoid possesses much greater antigenicity, and because of this it is preferable to the plain toxoid. Hall[16] states that alum-precipitated tetanus toxoid is now routinely used for immunization of all midshipmen at the United States Naval Academy.

Gas Bacillus Antitoxin.—Most surgeons also include gas bacillus antitoxin in the routine prophylaxis of patients, and when the wound looks particularly dirty or is badly macerated give a second prophylactic dose. The British Medical Research Council[32] recommends for prophylactic use a polyvalent antitoxin consisting of 3,000 international units *Cl. welchii,* 1,500 international

units *Cl. septique,* and 1,000 international units *Cl. œdematiens,* given either intravenously or intramuscularly. For therapeutic use, they suggest a polyvalent antitoxin consisting of 7,500 international units *Cl. welchii,* 3,750 international units *Cl. septique,* and 2,500 international units *Cl. œdematiens,* given intravenously and repeated as necessary while symptoms of toxemia persist. Specific monovalent antitoxins are suggested for more intensive therapeutic use when the organism has been identified.

Sulfonamides.—While it is argued by a few surgeons that the value of the routine use of sulfonamides is still debatable and that sufficient experimental and clinical work has not yet been done, most surgeons feel that these drugs are a necessary addition to the treatment of contaminated wounds. An increasing number of reports now attest to the decrease in the incidence of infection following their use, particularly after local implantation.[5,6,8,18,22,44]

Jensen, Johnsrud, and Nelson,[21] as well as Key and Lembert,[26] found that the local concentration of sulfanilamide is from 80 to 100 times higher than that obtained in the blood stream after systemic administration, and that the action of the drug enclosed in the wound lasts longer. Hawking,[17] in a series of experiments on guinea pigs, noted that "sulphanilamide is absorbed from wounds very quickly (in less than twenty-four hours), giving a high but transitory concentration in the fluids of the wound (1,500 mg. per 100 c. cm.); sulphapyridine is absorbed slowly from the wound (seven to ten days) and its concentration in the wound is low (42 mg.) but prolonged; sulphathiazole occupies an intermediate position, being absorbed in about five to six days and producing a concentration of about 104 mg." In treating patients with compound fracture wounds, as well as suppurating sinuses and various ulcers, by local insertion of sulfanilamide and sulfathiazole up to 5 grams, Hawking[18] noted that the sulfonamide concentration "in the blood after twenty-four hours was rarely above 1.5 mg. per 100 c. cm., and usually it was less than 0.5 mg. per 100 c. cm. Consequently," he concludes, "it seems that this local treatment can safely be reinforced by oral administration of the compound, and that in many cases such reinforcement should be desirable."

Key and Frankel[27] observed that sulfanilamide, sulfapyridine, and sulfamethylthiazol in powdered form "were equally well tolerated by the tissues and that they did not materially affect the rate of healing of wounds in experimental animals. . . . As a result of their observations it was concluded that sulfanilamide was the preferable drug because of its greater solubility, it being approximately four times as soluble in the tissue fluids as was sulfapyridine or sulfamethylthiazol."

Leonard R. Broster, of London, in an address before the American Surgical Association in April, 1941, stated that in the British army sulfathiazole is now being used in place of sulfanilamide and sulfapyridine. According to him, the standard treatment for gas bacillus infection at the present time is débridement, sulfathiazole, and serum injections. In America, Weil[48] is one of the enthusiastic advocates of sulfathiazole, particularly the sulfamethiazole, which he insufflates into the wound. He states that he and his associates "have recently been able to close up compound fractures after introducing perhaps anywhere from 100 to 150 grains," without evidence of infection.

Recent experimental studies show that sulfadiazene, the pyrimidine analogue of sulfapyridine, is less toxic and gives higher blood concentration levels than sulfapyridine or sulfathiazole.[38] This new drug promises to play an effective rôle in compound fractures.

It is generally emphasized, however, that the sulfonamides should not be considered a substitute for careful surgical procedures but an adjunct to them.

Roentgen-ray Therapy

According to Kelly and his associates,[24,25] roentgen-therapy has not only lessened the mortality from gas-forming infections, but has decreased the need for mutilating operations. They see no contra-indication to its use by a competent radiologist. They suggest that treatment by this means should be given morning and evening over a period of three to five days. Also that it should be "of sufficient voltage to insure penetration of the involved tissue: from 90 to 100 kilovolts on an extremity, 1 mm. aluminum filter, from 130 to 160 kilovolts on the trunk with increased filtration; about 100 roentgens per treatment over each area."[23] They state that "if treatment extends beyond the third day and unless new areas

are being treated, 50 r per port might be sufficient."[24] Cantril[7] points out that "the technique of roentgen irradiation requires the use of large fields and the irradiation of far more of the body than the locally involved area. Gas infection of an extremity," he says, "necessitates irradiation by multiple portals of the entire extremity and the adjacent portion of the trunk." He recommends that all areas be treated two or three times daily, and that treatment be continued as the clinical indications warrant. In some of the cases in his series "therapy was continued over a period of 13 days because of the persistence of crepitus."

Kelly and his co-workers[24,25] analyzed a series of 132 cases of gas gangrene treated by irradiation, and found the mortality rate to be 11.3 per cent. This included cases from their own practice and data collected from various radiologists and surgeons. Smaller series showing favorable results with roentgentherapy have been reported by Williams and Hartzell,[49] Godby,[15] Sewell,[40] and Cantril. On the other hand, Cubbins et al.[12] doubt the value of this therapy. They state that "in 8 cases of proved gas infection that were treated with x-ray without surgery or antitoxin there were 8 deaths." Coleman and Bennett[9] also found the results in a series of fourteen cases of gas gangrene treated with irradiation alone to be disappointing. In neither of the last two series, however, were further details of treatment given.

Caldwell,[4] treating by various means experimentally produced compound fractures of guinea pigs infected with a lethal dose of *B. welchii,* found that wounds "sutured and treated with roentgen rays in varying dosage at different intervals were followed by death in seven of ten animals." From these experiments he concludes that "roentgen-ray treatment has no effect upon the progress of a fulminating type of gas gangrene, but does bring about some localization of the process when given one to two hours after inoculation, and when the animals survive forty-eight hours and longer." Implantation of zinc peroxide paste and suture of the wounds after débridement and irrigation resulted in the survival of four of five animals in his experiments. It is of interest to note that Kelly and Dowell[23] in 1936 stated that they had attemped to do some animal experimentations using guinea pigs. They could not, however, determine anything to their satisfaction. It seemed to them that the pig was too small an animal to inject with the virulent gas gangrene and then attempt to cure with roentgen rays. If a real active strain of gas bacillus organisms was used the infection traveled so rapidly, they found, that it was soon necessary to treat most of the pig, and the combination of general body irradiation left too much undecided. Some pigs got well and some died, and in the end, they said, they determined nothing.

In spite of the encouraging results obtained by some, it was pointed out that the value of roentgen therapy could be estimated conclusively only when large series of cases are made available for study. And most surgeons seemed to feel that this therapeutic measure, like the sulfonamides, should not be used in place of, but as a supplement to, sound surgical measures.

Brailsford,[3] among others, recently called attention again to the fact that gas formation in the tissues can be detected by means of roentgenography long before clinical signs have been produced. According to Williams and Hartzell, the gas in the tissues, which increases steadily in amount, "travels along the fascial sheaths and muscle planes producing a typical, almost pathognomonic appearance."

The work of Maes[29] and his associates is of interest. They observed that woolen clothing is a common source of anaërobic infection, and that gas gangrene might also have a seasonal incidence. Maes urges that "physicians suspect anaërobic infection with production of gas gangrene whenever wounds of the extremities involving muscles have been contaminated with wool or with soil."

Analysis of Cases

An analysis was made of twenty-five consecutive cases of compound fractures, from 1937 to 1940. Twenty-two were charity patients, treated at the University of Oregon Medical School Hospitals, and three were private patients treated at St. Vincent's Hospital in Portland. There were twenty-one male patients and three female patients, a ratio of 7 to 1. The oldest was seventy-six years of age, the youngest two and a half. The average age was thirty years.

In this series, as in others in the literature, the majority of the patients had some sort of automobile accident. The twenty-five patients had twenty-nine compound fractures, and practically every one of them had one or more addi-

tional simple or comminuted fractures as well as lacerations and bruises of varying severity. Two patients had four traumatic amputations of the terminal phalanges of the hand. The distribution of the compound fractures is shown in Table 1.

TABLE I. COMPOUND FRACTURES IN TWENTY-FIVE PATIENTS

Site	No. of Fractures
Skull	2
Maxilla	2
Humerus	1
Radius	1
Ulna	2
Phalanges of hand	9
Ilium	1
Femur	1
Tibia and fibula	8
Os calcis	1
Astragalus	1
Total	29

The interval between the time of the accident and the institution of treatment varied from one to eight hours in the great majority of these cases. Six patients were admitted after initial treatment in another hospital—such as cleansing, débridement, suturing, splinting. One patient was admitted with an ununited fracture of six months' duration.

No single type of treatment was followed in the present series, and more than one doctor cared for the patients. In most instances, however, cleansing, débridement, and copious irrigations with saline were carried out. Some wounds were closed primarily, others were packed open. Plaster casts were applied in thirteen instances, and windows were cut for wound inspection and for dressings. Some means of internal fixation was used in seven cases. In four instances treatment included Dakin's irrigations. Three patients had oxygen inhalations. Use was made, as the need arose, of sedatives, various types of local packs, artificial heat, blood transfusions, intravenous saline and glucose, and other supportive measures. Eight patients were given prophylactic tetanus antitoxin, and seven others were given both tetanus antitoxin and anti-gas-bacillus serum. Irradiation was used in only one instance. Ten patients received sulfanilamide. In one instance the sulfanilamide was supplemented by sulfapyridine; in another by sulfathiazole. In only two instances was sulfanilamide used prophylactically, and in only two instances was the drug applied locally.

Most of the patients had complications of one kind or another, the most frequent being local infection. One patient had persistent hematuria which was traced to a ruptured kidney and which necessitated nephrectomy. One patient developed tetanus and died. Two had osteomyelitis which was satisfactorily controlled. There were two cases of gas bacillus infection. Both patients had a therapeutic amputation. One died, the other recovered after a prolonged and stormy convalescence. The patient who recovered was a twenty-six-year-old man who had sustained a compound fracture of the right tibia and fibula and a simple fracture of the left tibia and fibula. His treatment included first débridement and irrigation, Steinmann pins, a fenestered plaster cast, 1,500 units tetanus antitoxin as well as 2,000 units each *perfingens* and *vibrion septique*. Later, in addition to amputation, he had 10,000 units each of *Cl. welchii* and *vibrion septique* antitoxin, 130 grains sulfanilamide, and one roentgen-ray treatment—450 roentgen units over the posterior aspect and 450 over the anterior aspect of the stump. He was also given blood transfusions and other supportive therapy.

For comparison, ten cases of gas bacillus infection from the records of St. Vincent's hospital in Portland and seven cases from the Sacred Heart Hospital in Eugene, Oregon, were also studied. The results obtained are shown in tables 2 and 3. It will be noted that four of the patients had had prophylactic serum injections. Twelve patients had roentgentherapy, two of whom died. In no instance, however, was irradiation the sole therapeutic measure, and the two patients who died were both elderly, sixty-six and sixty-nine years of age, respectively. One had three roentgen treatments and 30,000 units of serum; the other had one roentgen treatment and 25,000 units of serum. Both had had extensive injuries, and would probably have died in spite of any treatment. Nine patients had sulfanilamide therapy, but this also was in no instance the sole therapy. Of the eleven patients who recovered, four had had amputations because of the severity of the injury, and four had had therapeutic amputations. Three patients recovered without amputation. In view of recent publications, it is possible that the four patients who had had therapeutic amputations might have

TABLE II.—NINETEEN CASES OF GAS BACILLUS INFECTION

Hospital	Age	Sex	Cause and Site	Incubation period	Serum Units		Sulfanilamide	X-ray		Amputation	Results
					Proph.	Therap.		Trs.	r's		
University	26	M	Fr. tibia, fibula*	2 mos.	4,000	20,000	130 gr.	1	900	T	Recovered
	76	M	Fr. tibia*	—	—	—	—	—	—	T	Died
St. Vincent's	29	M	Fr. humerus*	1 da.	+	—	+	3	288	T	Recovered
	30	M	Cut forearm	1 da.	—	160,000	435 gr.	9	855.6	N	Recovered
	42	M	Diabetic, toe injury	2 da.	—	—	1,120 gr.	7	681.8	—	Recovered
	21	F	Fr. leg*	5 da.	—	+	675 gr.	13	?	N	Recovered
	26	F	Fr. forearm*	1 da.	—	—	—	—	—	T	Recovered
	20	M	Fr. ankle*	4 da.	—	—	—	—	—	T	Died
	58	F	Lacerated arm	—	—	—	200 gr.	—	—	—	Died
	20	M	Abdominal wall	1 da.	—	—	—	—	—	—	Died
	60	M	Abdominal wall	2 da.	—	60,000	360 gr.	—	—	—	Died
	54	M	Fr. Pelvis	3 wks.	—	+	—	—	—	T	Died
Sacred Heart	39	F	Fr. tibia, fibula*	4 da.	3,000	—	375 gr.	5	500	T	Recovered
	24	M	Fr. tibia*	2 da.	—	235,000	895 gr.	14	1,400	N	Recovered
	27	M	Fr. femur	1 da.	1,500	—	50 gr.	5	500	—	Recovered
	19	F	Lacerated knee	5 da.	—	40,000	—	6	600	—	Recovered
	59	M	Diabetic	—	—	130,000	400 gr.	6	600	N	Recovered
	66	F	Fr. femur, pelvis, tibia	3 da.	—	30,000	—	3	300	—	Died
	69	M	Fr. tibia, fibula	2 da.	—	25,000	—	1	100	—	Died

*Compound fractures. Note: "T" indicates amputations done to control the gas infection. "N" indicates amputations done because of circulatory disturbance or extent of injury.

TABLE III. THERAPY IN NINETEEN CASES OF GAS BACILLUS INFECTION

Treatment	No. of Cases
11 Recoveries (57.89%)	
Amputation only	1 (09.09%)
Amputation, x-ray, sulfanilamide, serum	5 (45.45%)
Amputation, x-ray, sulfanilamide	2 (18.18%)
X-ray, serum	1 (09.09%)
X-ray, sulfanilamide	2 (18.18%)
8 Deaths (42.10%)	
No therapy	1 (12.50%)
Amputation only	2 (25.00%)
Amputation, serum	1 (12.50%)
Serum, x-ray	2 (25.00%)
Serum, sulfanilamide	1 (12.50%)
Sulfanilamide only	1 (12.50%)

survived without such a procedure. While nineteen cases is not a large series, it would seem, as has been pointed out by others, that a combination of accepted therapeutic measures gives the best results.

The average stay in the hospital of the twenty-five patients with compound fractures was sixty days. It should be noted, however, that all but three of them were cared for in a county hospital where treatment as a rule takes longer than in other hospitals.

In spite of the fact that treatment was not uniform or carried out by the same man in all instances, satisfactory results were obtained in nineteen, or 76 per cent, of the cases. In two instances the fracture did not unite. One of the patients subsequently had a sliding bone graft. Another patient, a boy of ten, was discharged from St. Vincent's hospital in apparently satisfactory condition after treatment of a compound fracture of the right femur just above the knee and a simple fracture of the left femur. A year and a half later he was again admitted to the hospital because of a staphylococcic septicemia with osteomyelitis of the right heel. This was followed by multiple chronic osteomyelitis, with the largest focus of infection at the site of the old compound fracture in the left femur.

Four patients died (20.00 per cent). Details of the deaths are as follows:

Case 1.—A twenty-four-year-old man was admitted to the hospital on July 4, 1940, about four and a half hours after being hit by a motorcycle. He had a compound, comminuted fracture of the left os calcis and astragalus, a comminuted fracture of the left tibia, and a comminuted fracture of the left femur. His leg had been put in a Thomas spint, and he did not appear to be in shock. Five per cent glucose, however, was given; and roentgenograms were taken.

Under cyclopropane anesthesia the wound on the lateral aspect of the ankle was cleansed with tincture of green soap, hydrogen peroxide, and alcohol; irrigated with large amounts of normal saline; and débrided. The fracture was reduced as well as possible. The wound was packed with vaseline gauze, rubber tissue drains were inserted, and the wound edges were brought together with interrupted silkworm sutures. A short plaster cast was applied to the lower leg, and a window was cut out over the wound. Tetanus antitoxin and anti-gas-bacillus serum were given, 1,500 and 2,000 units, respectively; and "prophylactic sulfanilamide was started."

The day after operation the patient had a slight chill and a temperature of 101.6 degrees. His condition, however, seemed to improve. On the fourth and fifth postoperative days he was given a blood transfusion of 250 c.c. On August 1, twenty-seven days postoperatively, the left thigh was manipulated, and a Kirschner wire was placed through the lower end of the femur in an attempt to correct some of the anterior bowing.

The patient continued to make good progress, and the wound was granulating in. On September 6, however, he complained of soreness of the neck. Three days later he could barely open his mouth or chew. There was no rise in temperature. Muscle spasm and difficulty in breathing developed next. Heavy sedation and large doses of antitetanus serum were started immediately after desensitization. A total of 171,500 units of serum were given—11,500 units being injected around the site of the wound and 160,000 units being given intravenously in normal saline. In spite of the large doses of antitoxin and the usual supportive measures, the patient died on the seventh day of active tetanus syndrome.

The essential postmortem findings were: delayed tetanus infection, bilateral bronchopneumonia, pulmonary edema and hyperemia, focal cystitis and urethritis.

Case 2.—The patient was about sixty-five years old, and was admitted to the hospital in coma on February 11, 1940, after having been found unconscious on the street. He had a compound fracture of the tibia and fibula, lacerations of the scalp, simple skull fracture, and concussion of the brain.

Shock was treated, and about two hours later the scalp wound was cleansed, débrided, and sutured. The leg wound was also cleansed and débrided; the fracture was reduced; the wound was closed; and a cast was applied. Supportive measures were instituted. The patient died, however, on February 14, 1940. A postmortem examination was not made. The cause of death was recorded as cerebral concussion, subarachnoid hemorrhage, cerebral edema, rheumatic endocarditis with hypertrophy, dilatation of the heart, pulmonary edema, terminal bronchopneumonia, and multiple traumatic injuries.

Case 3.—This patient was in shock practically all the time, and died ten and a half hours after admission to the hospital. He was thirty-four years old, and had a compound fracture of the right ileum; simple fractures of the right tibia and fibula as well as of the right scapula and of the ribs; and laceration of the scalp. A train had hit him, and he had been picked up by the next train that came along. He had been unconscious for three hours, and unable to move for about an hour after that.

Measures were instituted to combat the shock. About three hours later, under local anesthesia, the head wound was cleansed, débrided, and sutured. The wound over the ilium was also cleansed and débrided, and loosely closed with interrupted black silk sutures. The patient's general condition was extremely poor during the entire procedure, which was carried out in his bed. The left saphenous vein was cut, and a cannula was introduced for administration of fluids. Five and a half hours later, however, he expired. Post-mortem examination was not done.

Case 4.—The patient was a seventy-six-year-old man who had been struck by an automobile, sustaining a compound fracture of the tibia. The fracture had been reduced and a cast applied. His course, however, had been progressively downhill. Gangrene had developed, and amputation had been advised. One week after the injury, because of financial reasons, the patient was transferred to the University hospital where a Callander amputation of the gangrenous lower extremity was performed. He did not rally, and died two days after admission. Autopsy was not done. The cause of death was given as terminal bronchopneumonia and recent amputation.

Summary

A review was made of recent literature on the treatment of compound fractures. It was noted that these fractures are now generally regarded as emergencies, and that the success of their treatment is believed to depend largely on the duration of the interval betwen the time of injury and the operative care. First aid treatment is stressed, and an educational program in adequate first aid measures is advocated for those most likely to handle the patient at the scene of the accident. Emphasis is placed on meticulous and gentle débridement. The use of strong antiseptics has in most cases been supplanted

by irrigations with large amounts of saline solution. Internal fixation is practiced by some surgeons, and frowned upon by others. Some advocate primary closure of the wound, if too much time has not elapsed after the injury; others favor packing the wound open or irrigating it with hypochlorite solution. Rigid external fixation is stressed. The prophylactic use of tetanus antitoxin and anti-gas-bacillus serum is advised. Favorable results have been obtained with irradiation in the treatment of gas bacillus infections. And an increasing number of surgeons advocate the use of sulfonamides.

Twenty-five consecutive cases of compound fractures have been analysed. There were four deaths (20 per cent). No single type of treatment was followed. One patient died from tetanus. Two patients developed gas bacillus infections. Study of these and 17 additional cases of gas infection showed a mortality rate of 42.10 per cent in 19 cases.

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THE PRIMARY TREATMENT OF WOUNDS*

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WHAT I have to say is not new and not dramatic. It is a reiteration of surgical principles, so simple that many of you will say, "Why repeat something that we all know so well?"

The answer is that it requires repetition of basic surgical principles to help us maintain a proper perspective and a judicial attitude toward the New Deal that is constantly being urged upon us for consideration and adoption. It is easy to desert the highway that leads us to our destination with certainty when there are many alluring bypaths that promise an easy and rapid route to the desired objective.

The surgical principles that seem to us of basic importance and that have stood the test of time in the treatment of compound injuries are six in number:

1. Not to add contamination to the open wound.
2. Not to add trauma.
3. At the earliest possible moment and by the simplest possible method to transform the contaminated wound into a clean wound.
4. If the latter can be accomplished within a few hours of the time of injury, to repair the injured structures and close the wound.
5. If the optimum time has passed, to cleanse the wound with the same care one would use if it were to be closed, but to omit repair of injured structures, and, in severe cases, closure of the wound.
6. Whether injured structures are repaired immediately or not, to secure rest for the injured part with the aid of a dressing that immobilizes it and provides an even and constant pressure over the wound area.

I should like to discuss each of these principles very briefly.

1. *Not to add contamination to the open wound.*

Evidence is constantly accumulating that indicates the important sources of infection of open wounds. The most important in our judgment are the mouth and nasopharynx of individuals who harbor virulent organisms; in other words individuals who are "carriers" and who may come in contact with the injured patient. Hare[1] has estimated that 7 per cent of healthy individuals harbor virulent streptococci in the mouth and nasopharynx, and he has concluded from a careful study of reports and statistics from the Great War that during that period the most important source of infection of open wounds was the mouth and nasopharynx of first aid workers, orderlies, nurses, doctors—of any of the many individuals who cared for patients with open wounds. Our experience has convinced us of the truth of Hare's conclusions. We are much more concerned over the possibility of contamination of open wounds from the uncovered mouth and nose of individuals working over the patient than we are about infection that may have been carried into the wound by the traumatizing agent or that may have been present on the patient's skin at the time of injury.

How can one avoid adding contamination to the open wound? By avoiding examination, probing, the application of ligatures; by simply covering the wound completely with a sterile dressing, applying a pressure bandage and an immobilizing splint *immediately after the injury has been sustained.*

2. *Not to add trauma.*

It is generally admitted that it is unsportsmanlike to attack a man when he is down. We sometimes forget that rule when we are confronted with an open wound in which delicate fragile tissues, which normally are protected by a firm and resistant covering, lie exposed to the open world. Thinking only of the possibility that bacteria may be present in the wound and anxious to destroy them we flush or irrigate or paint the vulnerable tissues with chemical solutions that may destroy a few bacteria, but that destroy just as certainly the living tissues which are actually our strongest defense against bacterial infection. I need only recall to your mind the many experiments that show the constant presence of

*From the department of surgery, Northwestern University Medical School. Abstract of a discussion presented before the Minnesota State Medical Association, St. Paul, Minnesota, May 27, 1941.

pathogenic bacteria in the washings from clean surgical wounds and that in spite of this contamination such wounds constantly heal by primary union.[2] It might be well to recall to our minds Halsted's observation that if bacterial cultures are injected in the normal peritoneal cavity infection does not take place, but if devitalized tissue is present peritonitis invariably follows. If we can avoid adding injury—mechanical or chemical—to that which the patient has sustained the chance of securing a successful result is definitely increased.

3. *To transform the contaminated wound into a clean wound.*

In our judgment there is no method so effective and none which carries so little risk of injuring the exposed and vulnerable living tissue as the use of plain white soap and sterile water applied with soft cotton and gloved hands, gently but thoroughly for a period of not less than 10 minutes and followed by prolonged irrigation of the cleansed wound with warm saline solution. For a number of years now we have used nothing else in the pre-operative preparation of open wounds except for the occasional preliminary use of a fat solvent, such as benzine, to remove an excess of grease. With the use of this method our results have improved steadily, and we would not willingly return to the use of antiseptics in the pre-operative preparation of compound injuries.

Although the excision en masse of a thin layer of tissue from the surface of the wound is theoretically an ideal method of converting a contaminated wound into a clean wound, practically such a method is possible of execution only in a minority of cases. Traumatizing agents do not often stop short of nerves, tendons, important blood vessels and bones. One cannot sacrifice vital structures to make complete wound excision possible, and too often the attempt to carry out excision results only in a makeshift procedure and secondary contamination of freshly made raw surfaces from contaminated vital structures in the deeper portions of the wound.

4. *Repair of injured structures and closure of the wound.*

If the open wound can be converted into a clean surgical wound it is logical immediately to repair the injured structures and close the wound. "If" it can be accomplished depends upon the time that has elapsed since the injury that was sustained, the type of first aid care that has been given, the extent and character of the injury, and the patience and care the surgeon is willing and able to render. If all the conditions are favorable, immediate repair and closure can usually be accomplished with every likelihood of a favorable outcome. How much skillful care immediately after an injury has been sustained can contribute to a successful outcome has been emphasized and demonstrated particularly in the field of maxillofacial surgery. It is only logical to say that the same principles advocated by the maxillofacial surgeons apply to injuries of every part of the body. If we delay the reduction of fractures of bone, of tendons, of nerves and soft tissues until inflammatory reaction and fibrous tissue formation have resulted in some degree of permanent and irreducible deformity the unhappy results may not be as apparent in some parts of the body as they are in face and jaw, but the most favorable moment for surgical treatment has been lost just as certainly and irretrievably.

5. *Care of the wound after some hours have passed.*

If more than two or three hours have elapsed before the injured patient comes to the surgeon the possibility of transforming the contaminated wound into a clean surgical wound is definitely diminished. In such a case we would cleanse the wound just as carefully as in the first instance, reduce fractures of bone with the same care, but not attempt reduction of soft tissue fractures until wound healing is complete. If in such a patient no wound infection develops, repair of injured structures can be accomplished within three or four weeks and under the most favorable conditions. To attempt, however, the surgical dissection essential for repair of injured muscles, tendons and nerves when pathogenic bacteria are beginning to invade the body tissues is to court disaster.

6. *Rest for injured tissues.*

"Inflamed and injured tissues need rest" just as truly today as in the time of Ambroise Paré, Baron Larrey and Hugh Owen Thomas. Orr has helped us to a new understanding of its importance, and British surgeons today are rediscover-

ing the meaning of this often neglected surgical principle.

Philip Wilson said recently in an address before the American Surgical Association that British surgeons were agreed that the advantages of the closed plaster method of treating compound fractures after securing complete reduction of fractured fragments lay in uninterrupted rest, freedom from the constant danger of contamination during every change of dressings and in the helpful effect of uniform pressure over the injured limb. A constant pressure, not constricting or rigid but with some degree of elasticity, is of definite value in aiding the return flow of blood, and so helping to maintain an adequate circulation.

If in our treatment of compound injuries, whether they be lacerated wounds, compound fractures or extensive burns, we constantly ask ourselves if our methods are consistent with basic and time-tested surgical principles we shall not go astray in our treatment.

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HUMAN BLOOD SERUM: ITS PREPARATION AND USE*

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HUMAN blood serum has been used as a blood substitute for many years. Rous, Wilson,[20] Strumia,[22] Kallius,[7] Levinson,[13] and Elliott[4] are some of the pioneers in human serum transfusions. According to Levinson, there are no great differences between plasma and serum as transfusion fluids. Plasma, however, cannot be kept over a long period of time because fibrinogen gradually precipitates out in the form of fibrin veils and granular precipitate and requires filtration or centrifugation and clearing before administration. After most or all of the fibrinogen has precipitated out, the solution consists essentially of serum diluted with sodium citrate. If the original intention of the laboratory is to prepare either serum or plasma, serum is preferable.[13]

Blood plasma is resolved by clotting into serum and fibrin. The fibrin forms only .2 to .4 per cent of the total weight of blood. The serum contains in one hundred parts, eight to nine parts of solids, of which seven to eight parts consist of proteins, while the salts make up one part. The proteins probably do not exist side by side in the serum but are combined to form serum protein which acts as a whole.[1] The chief salt present in the serum is sodium chloride, and next to this comes sodium bicarbonate, and besides these two we find traces of potassium, sodium, and calcium chlorides and phosphates. Traces of fats, cholesterol, lecithin, glucose, urea, amino acids and other nitrogenous extractives are constantly found in the serum. The fats are much increased after a meal rich in them and may give the serum a milky appearance. The yellow color of the serum is due to the presence of bilirubin, carotene, and xanthophyll. Blood serum contains thrombokinase, prothrombin, and thrombin. Thrombin rapidly disappears from the blood serum in two to three days. The disappearance of thrombin from serum is due to its combination with serum protein. This combination can be broken up by the addition of small traces of acid or base and the serum reactivated.[21] The plasma prothrombin in preserved blood decreases very gradually, reaching the 50 per cent level at the end of about three weeks.[24]

We have tried to find some method of preparation which would allow the general practitioner the use of this type of therapy.

We have used serum exclusively. Centrifugation, necessary for the preparation of plasma, is too complicated for the general practitioner to attempt and as far as we can see, is unnecessary.

Moon has shown that secondary shock essentially results from an uncompensated disparity between the volume of blood and the volume capacity of the vascular system. The most im-

*From the Adams Hospital, Hibbing, Minnesota. With the collaboration of Drs. B. S. Adams, C. Jacobson, C. N. Harris, C. S. Raadquist, M. F. Hayes.

portant factors in its production are capillary atony and tissue anoxia. The capillary atony caused by agents or conditions injurious to the capillaries, results in loss of plasma protein into the tissues, reduced blood volume, reduced volume flow, reduced delivery of oxygen and tissue anoxia. The tissue anoxia furnishes products of deficient oxidation which in turn produce capillary atony. Efforts to interrupt the cycle should be directed toward the restoration of the blood volume.[16]

Loss of erythrocytes in severe hemorrhage is seldom a vital factor. The sudden and marked diminution in circulating blood volume, however, is of grave and serious significance.[14]

Shock resulting from extensive trauma or burns is caused by absorption of substances released from injured tissues and by the effects of these on the visceral capillary bed.[16] The capillaries become abnormally permeable to the plasma protein which leaks into the tissues causing a concentration of the blood and consequent secondary shock. Loss of protein is clearly an important and serious effect of severe cutaneous burns. This loss affects not only tissue protein but also plasma protein. It seems likely that many if not all of the general manifestations of severe cutaneous burns are connected with this loss.[5]

In acute glomerulonephritis, nephritis with a nephrotic tendency, or lipoid nephrosis, the most important factor in reducing the patient to a state of cachexia is the loss of plasma protein through the damaged capillary walls.

The use of convalescent blood serum in the treatment of severe infectious diseases has been a procedure of value for years.[12]

The ideal fluid then for the treatment of secondary shock due to trauma or severe burns, acute hemorrhage, hypoproteinemia, and acute infectious diseases, should meet the following requirements:

1. It should be easily prepared.
2. It should be easily preserved and stored.
3. It should be low in cost so it can be made available to all.
4. It should contain the necessary elements to maintain the colloid osmotic pressure of the blood.
5. It should contain specific antibodies.

Human blood serum is that ideal fluid.

There are many drawbacks to the use of whole blood in emergencies. Before a blood transfusion can be accomplished, certain procedures have to be done. The patient must be grouped and the donor must be grouped, and then they must be cross matched. Wasserman testing must be done. Even when these procedures are done by a trained personnel, they are time consuming. In this time interval the state of shock may become irreversible and fatal.

In an emergency the use of stored blood is an excellent measure, although evidence is accumulating that stored blood is inferior to fresh blood, especially if the storage has been for more than seventy-two hours.[8] Even with the use of stored blood, there still remains the unavoidable delay due to the necessity for typing the patient's blood, performing compatibility tests, and filtering the stored blood.[14] Reactions following blood transfusion are still relatively frequent.[9,15]

As Levinson points out, there are two handicaps that restrict the usefulness of blood transfusion, unavoidable delay before administration and reactions, both primarily due to the corpuscular elements of the blood.[14]

The crystalloid solutions are of only temporary beneficial effect. They increase blood volume but owing to the fact that they do not remain in the circulation their beneficial effects are only transient. When such crystalloid solutions diffuse out of the abnormally permeable capillaries, the increasing edema is decidedly harmful.[13]

Human serum is the ideal fluid to use in the treatment of the secondary shock due to trauma or severe burns, hemorrhage, and hypoproteinemia. Because of its antibody content it also has a wide field of usefulness in severe infectious diseases. We don't believe that anyone yet has evaluated correctly the true worth of human serum in the treatment of severe scarlet fever, measles, mumps, meningitis, nephritis, et cetera.

We have given human serum in forty-three infusions to eighteen individuals. We have used the serum indiscriminately, making no attempt to pick any special type of case. We have tried to prove or disprove the advantages and disadvantages of serum by using it in different therapeutic problems.

Temperatures were taken when the serum was given and then one hour after the serum had been discontinued. In a few instances blood pressures were taken in the same manner. The

nurses were told to record any subjective symptoms the patients complained of following or during the administration of the serum. In no instance was there any subjective discomfort

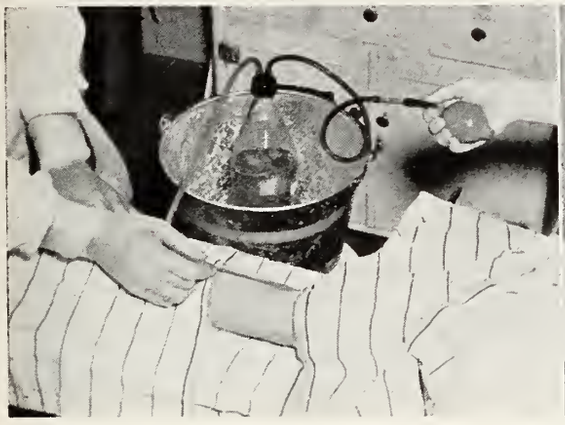


Fig. 1.

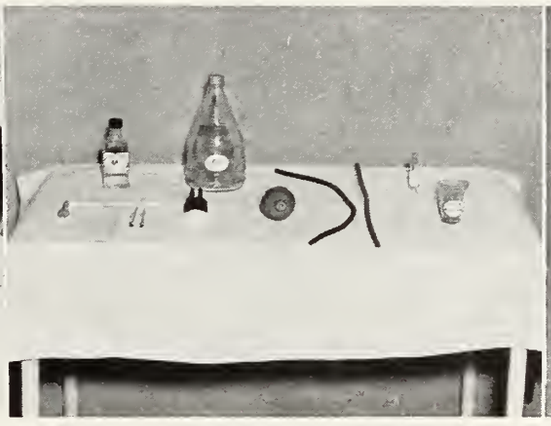


Fig. 2.



Fig. 3.

which we felt was due to the serum infusion. In ten patients the temperature rose one hour after the infusion. The greatest rise was 2.4 degrees. The temperature dropped in eleven patients following the serum administration. The greatest drop was 1.0 degree. Sixteen patients had no change in their temperatures after the serum had been given. In three individuals the blood pressure rose after the infusion. In one patient the blood pressure fell one hour after the transfusion, to rise again during the second hour.

We had three deaths in our series. None of these deaths was in any way related to the serum infusion. All came to necropsy. One patient died with a gangrene of the ileum which he developed following a cholecystectomy, another in secondary shock following a resection of the cecum, and a third with general peritonitis and empyema following a ruptured appendix.

From our limited experience with human serum, we feel that it should be used widely in those postoperative courses that are prolonged for one reason or another and leave the patient with a generalized capillary atony and a tendency to the formation of edema. In these patients the serum seems to best stimulate their circulatory systems and rid them of surplus body water.

We feel, with Elliott,[4] that the indication for transfusion in pediatrics is usually for the serum rather than for whole blood. We feel that it is indicated early in the course of the acute diarrheas and upper respiratory infections of infants. We gave it intramuscularly in these instances.

Two patients were of especial interest.

Case 10.—This patient was a boy, aged eight, who came to us with a typical nephritis with a nephrotic tendency. When the diagnosis was made, he was immediately started on human serum. Diuresis began at once and his blood pressure also began to drop. After eight infusions all the patient's edema was gone, and the blood pressure was normal. The boy's usual weight was fifty-one pounds. Following sixty days of bed rest, he weighed forty-nine pounds. We believe the serum was responsible for keeping him in such good physical condition.

Case 45.—This patient was a boy, aged eighteen, who had the most toxic scarlet we have ever seen. When we first saw him, he had been on sulphanilamide and sulphathiazole for four days. Following an infusion of 100 c.c. of human serum, the boy's temperature rose from 103-R at 7 P.M. to 104-R at 9 P.M., then declined successively to 102-R at 1 A.M., 101-R at 5 A.M., 100-R at 7 A.M. and 99.2 at 11 A.M. The following day he was given 100 c.c. more of the serum. His temperature, which had risen to 101, came down to 100 at once. The following day the temperature became normal, and it never went over 98.6 again during his convalescence.

Human serum can be prepared easily, preserved indefinitely by the addition of merthiolate or sulphanilamide,[3,18] and shipped any place with no deterioration of the product. Compatibility tests may be omitted because of the fact that neutralization of agglutinins by both tissue and serum of the recipient provides a wide margin of safety in protecting the recipient's red blood cells from the infused agglutinins.[11] A low agglutinin titre can be prepared by pooling a large number of serums of varying blood groups.[11] Human serum in contrast to animal serum does not sensitize human subjects nor does it produce anaphylaxis or serum sickness.[10]

Our serum is prepared simply, easily, and

cheaply, in the following manner. Our apparatus consists of an Abbott intravenous bottle, a two-hole bakelite cap that fits the bottle, two lengths of rubber tubing, a transfusion needle which fits into one of the pieces of tubing, and a rubber bulb which fits into the other tubing (Figs. 1 and 2). Fifty cubic centimeters of a 1-1000 solution of merthiolate are first placed in the intravenous bottle for each five-hundred cubic centimeters of blood to be withdrawn, giving a final concentration of 1-10,000, and the transfusion needle and rubber tubing connecting it to the intravenous bottle are then washed out with a few cubic centimeters of 2.5 per cent sodium citrate. The bottle is then placed in a pail containing ice and water, and the needle being inserted in the vein of the donor, the blood is allowed to run into the bottle. A clamp in the bottom of the pail holds the bottle securely in the ice bath during the transfusion (Fig. 3). In this way the blood is cooled as quickly as possible to a temperature of 5°C. De Gowin[2] found that this procedure effectively prevented initial hemolysis of the blood. When the required amount of blood has been withdrawn, the tubing is disconnected from the intravenous needle and the last five cubic centimeters of blood are allowed to run into a Wassermann tube and sent to the State Board of Health immediately. The bakelite cap is then removed from the bottle containing the blood, and a sterile metal cap is screwed onto the bottle. The bottle, after being labeled, is placed in a refrigerator at 5°C. After forty-eight hours, the supernatant serum is withdrawn from the bottle, using the same apparatus and sterile precautions as were used in drawing the blood from the donor. After all the Wassermann reports have been received, serums from different individuals are pooled and allowed to remain together for from two days to weeks, depending upon the demand for serum. The serum is used diluted with 400 c.c. of 5 per cent dextrose in physiological saline and 50 c.c. of 1-1000 solution of merthiolate. The intravenous bottles containing this mixture are kept in a room adjacent to the operating room so they can be used at an instant's notice. When we first began using serum, we used the serum undiluted, but we have found the dilution with dextrose in saline a more satisfactory way to administer it.

We believe that human serum is the ideal fluid for use in secondary shock due to trauma or severe cutaneous burns, acute hemorrhage, hypoproteinemia, and in severe acute contagious diseases. We believe that every man practicing medicine should have human serum at his disposal. It has not been used as much as it should be by the general practitioner because of its apparent high cost and the apparent complicated processing necessary for its production. We believe we have a simple, easy, cheap method of preparing serum which will furnish the physician with a therapeutic aid which once used he will not be without.

We agree with Levinson,[13,14] that human blood serum is the ideal blood substitute. We have used much smaller amounts of serum in transfusions than has Levinson. We will possibly increase our amounts after we have used more of the serum and have had a wider experience. We have rarely had to give more than 100 c.c. of diluted serum at any one time before securing the desired effect.

Strumia[22,23] insists that the intravenous use of serum is accompanied by severe reactions. No reactions were observed in our forty-three infusions reported. Levinson reports one local reaction consisting of pain along the vein into which the serum was being given, in a multitude of infusions to forty-seven patients.

Summary

1. Human serum is recommended to the general practitioner for more general use.

2. The therapeutic indications for its use are reviewed; secondary shock due to trauma or burns, acute hemorrhage, hypoproteinemia, and acute contagious diseases.

3. It is suggested that serum be used in the treatment of the acute diarrheas and upper respiratory infections of infants and as a more frequent agent in prolonged postoperative convalescence.

4. The drawbacks to whole blood transfusion are mentioned.

5. Eighteen patients who received forty-three transfusions of human serum are reported.

6. A simple cheap method of preparing and preserving human blood serum is described in detail.

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PSYCHOSOMATIC MEDICINE*

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THE word "functional" used as a medical term to describe a symptom or physical disturbance has been greatly abused by the medical profession and has led to careless thinking and wasteful inactivity on the part of many physicians. It is a term used too frequently in cases of obscure etiology, those unresponsive to treatment, and others that recur with an almost willful stubbornness. It covers a multitude of sins. It has come to imply something that the word literally does not mean. A functional illness should mean an illness whose symptoms are due to a disturbance of the function of an organ, or group of organs, but as used by the average physician it does not mean that, but has come to imply a condition for which no organic disturbance can be demonstrated. Since no abnormality can be shown by physical examination, x-ray, microscope or test tube, the attending physician appeases his conscience, bolsters his pride, and obtains a diagnosis by labelling the condition "functional," a label that has come to mean in most instances that the condition is considered nervous in origin. This state of affairs would not be so bad if the physician, upon making the diagnosis of a functional condition, would realize that conditions do not arise without a cause, and would diligently try to find that cause. With few exceptions, this is not done. It requires too much time, or the condition is not considered serious enough, to help the patients find their way to someone who is interested, and whose business it is to take the time.

The so-called functional case is usually treated entirely symptomatically, or else dismissed with the statement, "You're just nervous, go home and forget it." The patient then drifts from one regular practitioner to another, finally falling into the hands of a badly trained irregular. If the condition is organic, much valuable time may be lost, if psychogenic, the suggestive therapy handed out in huge doses in an objective way may temporarily relieve the condition, only to have it return because the real foundation of the symptom has not been uncovered, but has been covered up, even more deeply.

The acceptance of the term "functional" as opposed to "organic" has misled medical practitioners from the realization that psyche and soma are inseparable. If by functional we mean a condition having no organic basis but one caused by emotional disturbances, would it not be better to use the word psychogenic, thereby at least implying that the condition has a genesis, that it started from something. However, it must be remembered that a truly functional con-

*Read at the annual meeting of the Minnesota State Medical Association, Saint Paul, Minnesota, May 26, 1941.

dition may be present and not be psychogenic in origin.

After accepting the word psychogenic as meaning a condition having its origin in the emotional sphere, let us be careful lest we still regard psychic and somatic as having no real relationship. The pioneer work of Cannon and his long years of physiological research have pointed out in convincing fashion the effects of emotions on bodily functions. In a recent paper[2] he expressed the opinion that the medical profession has not recognized in a practical way the nervous strain of modern life as a cause of disease, and he emphasizes the importance of regarding man as a mind-body unity. He discusses the ways in which success may be achieved in the treatment of emotional disorders by efforts to affect the emotions so that they are no longer harmful in the physiological sense, and will, therefore, cease to produce tension and turmoil, responsible for many symptoms causing distress and disability.

Within the past decade or so the epoch-making researches of Cannon have been applied by many workers who have brought about a practical interpretation of the inner relationships of the psychological and physiological. Not only has it been shown that emotional disturbances produce symptoms of organic disease, but it has also been shown that emotional disturbances in time actually cause organic disease, and if the treatment of the psychic disturbance is successful at a stage of the organic disease development that is not irreversible, the organic disease improves and even disappears.

Dunbar[3] has collected and coördinated over two thousand papers dealing with the effects of emotional disturbances on bodily functions and the production of bodily changes. As a result of her work and others, rapid and increasing interest in the psychosomatic approach in the understanding and treatment of disease has been shown and the terms psychosomatic and psychosomatic interrelationships have arisen and been accepted in medical literature. Many of the larger medical centers and hospitals have programs under way with the purpose in mind of coördinating various departments of medicine with psychiatry so that the interrelationship of psychic and somatic etiology may be better understood. Thus the patient is treated as a whole, rather than as a group of parts. This study is not being carried out with the idea in mind of determining what organic-like symptoms are psychogenic in origin, or what psychic symptoms are organic in origin, but rather to determine what part the psychic factor has in the etiology of an organic disease, or in the prevention of adjustment of the patient to an organic disease. This approach likewise seeks to determine in what way the somatic disease influences the emotional adjustment of the individual, in what way the psychic preparation of the patient aids in the successful carrying out of a surgical operation, in what way a psychic disturbance delays the convalescence of a physical illness, in what way the presence of a somatic disease so disrupts the social, economic status, and environment of a previously well adjusted patient so that an entire new plan of living is necessary.

Psychosomatic medicine is not a new branch of medicine. It belongs to all fields of medicine. It must be absorbed by all branches of medicine. An adequate understanding of psychosomatic interrelationships, and a conscious following of its principles should serve to coördinate the various branches of medicine. It should do away with many of the evils of specialization; a condition that seems necessary to modern scientific medicine.

That the psychic component in the etiology of and its influence on the treatment of all types of diseases is an important one is evident by many excellent papers in various medical fields.

The scope of this paper does not allow an extensive review of the related literature; however, a citation of some of it should be of interest.

Moschcowitz[6] has listed several syndromes which he believes to be psychogenic in origin, including such conditions as spastic and mucous colitis, cardiospasm, gastric and duodenal ulcers, essential hypertension and exophthalmic goiter. He states that such diseases are but exaggerations of normal functions, and that in the evolution of such organic diseases there are three stages: (1) the constitution of the individual; (2) the fixation of an exaggerated function of the organs affected; (3) the development of a lesion.

Fetterman,[4] in discussing the correlation of psychic and somatic disorders, states that a common factor in obscuring an organic disease by psychic complaint is a marked fear reaction. A local disease process may so alarm the patient that fear reaction leads to self study, insomnia, trembling, weeping, and such changes in mood

as to almost hide the organic disease. He further states, "It is in the neuroses that the vegetative factors dominate the picture. The essence of a neurotic illness is some emotional disturbance, often fear, and the viscera are the voice and vocabulary of the emotions. Conflict causes dizziness, discouragement, disturbance of the cardiac cycle; despair deranges digestion; shame alters the skin color; tension induces tremors; indecision brings about insomnia; fear spreads through the autonomic system to upset any and all of its functions. Through the diencephalon, and the vegetative pathways, every human emotion is physiologized."

Weisenberg[9] and his co-workers, in reporting the case histories of fourteen patients labelled neurotic, whose illnesses later proved to be organic, point out that the patient may have been neurotic in the past, and when he acquired a new illness, it was grouped with the previous neurotic record. They state that Head has shown that the viscera have cortical representations, and a visceral disease may cause psychic symptoms. Further that in certain illnesses there may be toxic factors that disturb the emotional balance. That frequently patients refuse adequate diagnostic study, and many patients are diagnosed as neurotic while the organic illness is still in the premanifest stage. The organic illness may be overshadowed by psychic complaints or by social catastrophe. The true cause of the patient's symptoms may be covered up because of the fact that the psychic disturbance is so evident that the physician's attention is distracted away from the underlying organic disease.

Robinson,[8] in a paper entitled, The Relation of Emotional Strain to Illness, summarizes as follows: "(1) A study of hospital patients with special reference to their social and personal problems has demonstrated that emotional strain frequently causes an important component of illness, deserving consideration in diagnosis and treatment. (2) A patient with an apparently unalterable organic disease is reported whose symptoms disappeared with the relief of emotional strain. (3) The significance of this case as an example of psychogenetic symptoms in organic disease, and the method of study and treatment used are discussed. (4) The need of greater consideration of the patient as a total individual in order to gain a better understanding of emotional disturbances as related to illness in hospital practice is emphasized."

Meyer,[5] in referring to general somatic symptoms which spring from mental causes and the importance of their recognition and treatment, states: "These disorders are common enough to make it a responsibility of any physician to learn something about mental causes and their workings. It is not likely that the general practitioner and the internist will be able to do their best without such knowledge. It will have to be acquired by a study of these events when and where they occur, with attention to the situation and to the facts that make reaction excessive."

Palmer,[7] in discussing the subject of functional bowel, states in his conclusion: "The important point is a recognition of the broad aspects of the varied symptomatology of the 'functional bowel,' and an approach designed to determine; first, whether or not organic disease exists; second, the significance of the disease in relation to the life of the individual; third, the determination and evaluation of the various factors involved in the functional disturbance in the case under consideration, and, finally, the planning of an intelligent program of rest, exercise, diet, medication and mental hygiene in order to bring about a more satisfactory adjustment between the individual and the environment, both internal and external."

Bernstein,[1] in the conclusion of his paper entitled, Skin Diseases from an Emotional Standpoint, states: "I would like to re-emphasize the importance of psychotherapy in the treatment of skin diseases of emotional origin. All other treatments are accessory to this. A dermatologist should have a working knowledge of neurology and psychiatry, psycho-analysis, allergy and endocrinology, and when he feels that his own knowledge of these fields is insufficient, he should not hesitate to consult a specialist in these fields."

It is, of course, self-evident that the neurotic individual may have an organic disease, entirely unrelated to the neurotic complaint from a symptomological or etiological standpoint, but it can hardly be said that there exists a neurotic individual with an organic disease, whose organic disease is not influenced by the emotional instability, nor can it be said that an individual suffering from a neurosis can possess an organic

disease without that disease affecting the neurotic manifestations.

It is important to remember that organic disease may cause neurotic-like symptoms, as well as that psychogenic disturbances may produce organic-like symptoms. Many physicians believe that all neurotic patients finally show organic disease as the cause of their symptoms. All neurotic patients may not have organic disease as a basis for their neuroticism, but psychiatrists are frequently consulted by patients whose complaints sound like psychogenic illness, but who present organic disease. Once again is stressed the importance of considering the individual as a whole, thereby avoiding the oft repeated mistake of focusing one's attention on what seems to be the important symptom or finding, and overlooking, in the background, the real basis of the illness.

Summary

1. It is pointed out that there is need for a clarification and a better understanding of what is meant by the term "functional."

2. It is recommended that the term psychogenic be used for all cases considered emotional in origin, thereby stimulating a search for the cause of the emotional disturbance.

3. The interrelationship of psychic and somatic disturbances are discussed and emphasis laid by examples from the literature of the widespread acceptance of this interrelationship and what it means to both psychic and somatic illnesses.

4. An appeal is made for a re-unification of the various branches of medicine through the recognition of the interdependence and inseparability of psyche and soma, so that, instead of considering man as a mind and body distinct from each other, he will be considered as a psychobiological unit.

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SECTION OF THE ANAL SPHINCTER*

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I FIND many physicians who are unfamiliar with the surgical procedure known as anotomy. Recently I looked through the indices of several works on rectal disease and found the term absent from most of them, although its misnomer, proctotomy, is occasionally mentioned. One might deduce that little attention is given to it because it is so well known that none is necessary, or because of the triviality of the procedure. I do not believe that either of these reasons is true. One of the questions most often put to me by physicians, interns, and students deals with the section of the anal sphincter.

Understanding the technique of anotomy presupposes a knowledge of the arrangement of the fibers of the sphincter muscle of the anus. These do not surround the orifice as a complete circle, but rather as a sling, gripping it laterally and anteriorly, dividing and decussating in the posterior commissure and finally joining to form the anococcygeal ligament. This anatomical distribution tends to weaken one point in the anal ring and furnishes one of the factors in the production of an anal fissure, so often seen in the posterior commissure. The formation of the sphincter at this point also permits us to divide it here with impunity, while actually severing but few of the fibers.

That there may be no confusion over the area involved I refer only to this region as the posterior commissure; that portion immediately adjacent to the coccyx. I stress this bit of terminology since proctologic illustrations are sometimes drawn with the patient shown in the lithotomy

*Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, Minnesota, May 29, 1941.

position, and at others with the patient prone, while an occasional writer still looks on the anal orifice as a clock dial and speaks of the relative positions as six o'clock, twelve o'clock, et cetera. The term posterior commissure is a definite one, regardless of position on the examining or operating table.

An incision may be made through the tissues at this point without interfering with sphincter competence and not only may be, but should be, done under either local, caudal, or spinal anesthesia. Inhalation anesthesia may easily lead to misinterpretation through the difficulty of attaining complete relaxation of the muscle.

The conditions offering the most nearly ideal indications for the use of this procedure are those making up the various forms of anal (not rectal) stricture. These include those involving the skin and tissues of purely ectodermal origin, the area at the level of the pectinate line, and those showing a general anal fibrosis. The chief complaint of individuals suffering from any of the above conditions is difficulty in moving the bowels, requiring the maintenance of soft or liquid stools in order to have a movement at all. Bleeding is also a frequent symptom since this usually accompanies repeated straining, the passage of a hard stool, a too-large stool, or lack of normal elasticity of the tissues involved. It is sometimes difficult to differentiate a fixed diminution in the size of the anal orifice from a tightness which is caused entirely by spasm, but the latter factor may always be eliminated by the use of a local anesthetic. The opening may be found to be so small as to barely admit the tip of the little finger, or decreased merely to the size where it grips the index finger firmly and further dilatation is impossible.

The above conditions have a number of etiologic factors, all contributing to the formation of fibrous tissue, rendering the anus inelastic, and finally fixing the size of the lumen. Now and then one sees a patient with no apparent cryptitis, without hemorrhoids, fissure, or other demonstrable lesion, and who apparently has had for years a slow inflammatory change going on in the anal canal, with the end result that the opening is far too small for the comfortable passage of a stool.

Such a case was that of an unmarried, sixty-year-old female recluse who, because of her almost continuous complaints—most of which centered on her bowel activities—was adjudged by her family to be mentally deranged. After a lengthy and rather cautious approach I was finally permitted to make a rectal examination. At the skin margin she had a band of indurated tissue surrounding the anal outlet and narrowing the opening to the size of a lead pencil. She had had prescribed for her any quantity of laxatives, suppositories, and ointments by physicians who had neglected to make a rectal examination. Posterior anotomy under caudal anesthesia, with a four-day stay in the hospital, gave her entirely normal bowel habits, and altered not only her entire outlook on life, but that of her family as well.

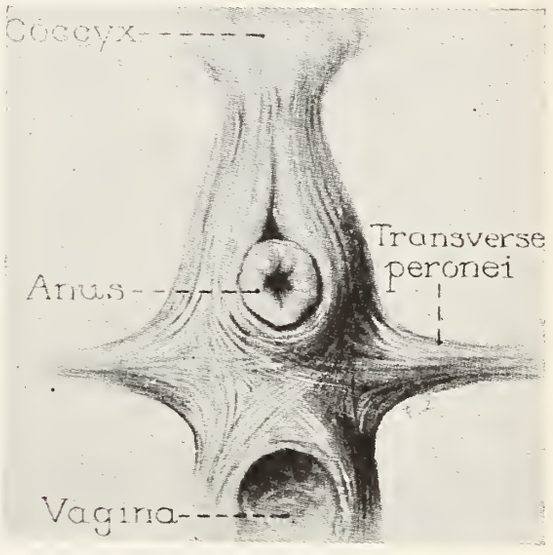


Fig. 1. Arrangement of the muscle fibers surrounding the anus (From Practical Proctology by Louis A. Buie).

A second illustrative case is that of a fifty-six-year-old farmer who told me that for twenty years he had not had a normal bowel movement, having to maintain an almost liquid stool to permit a defecation, and this always attended by more or less pain. Anotomy under local anesthesia transformed an anus which refused to admit the little finger into one of normal size. He gained weight, his general feeling of well-being was increased, and a year after his operation passes normal stools without oils or demulcents. He had no demonstrable pathologic change other than a fibrosis. A number of cases such as the above might be cited.

Since these cases are invariably found in persons at or past middle age, one concludes that the tissue changes are the result of years of a very slow process leading to a gradual thickening, loss of elasticity, and narrowing of the canal. We also know that this goes on to some extent in all

individuals, since it is a well known fact that a child is able to pass, without trauma, a larger stool than an adult. None of the above-mentioned conditions could pass unrecognized if rectal examinations were made routinely in patients with rectal symptoms, instead of the prescribing of laxatives, suppositories, and ointments with the hope that in some vague manner the symptoms will be abated.

The treatment of chronic anal fissure often entails a partial posterior anotomy since not infrequently the condition has existed for so long a time that there is a thickening of the entire posterior commissure. This latter, together with hypertrophy of the sphincter from long-continued spasm results in a narrowed anal outlet. Even though this is not the case, a posterior incision relieves spasm and the resultant pain, giving the fissure an opportunity to heal, and is, I feel, preferable to divulsion. Incision divides the tissues where the operator elects, divulsion leaves it to chance, and in average hands is far more likely to cause damage.

In the removal of numerous and large internal hemorrhoids one frequently finds it necessary to remove so much tissue that the outlet has been materially decreased in size. The time to determine whether or not this has been done, and to remedy it, is while the patient is still on the operating table, and not three weeks later. If at the completion of the operation the tip of the index finger enters the canal only snugly, it is probably too narrow for future comfort, and an incision should be made in the posterior commissure to enlarge it to the needed size. Even should this be not necessary it will do no harm. Sutures and ligatures with their resultant tension contribute largely to the discomfort following hemorrhoidectomy, hence it is my practice to make a posterior anotomy in all patients where there is any doubt as to the size of the lumen. I am certain that this procedure diminishes postoperative pain.

An incision in the posterior commissure is usually productive of but little bleeding. If there is any of consequence it is easily controlled by a ligature or two since exposure is easily attainable under local anesthesia. The incision should be made with one finger in the canal to determine the progress made in enlarging the lumen. The wound is packed with a strip of either dry or vaselined gauze which is left in for twenty-four or forty-eight hours. Doses of mineral oil or some form of demulcent should be started the same day as the operation, general diet, and hot sitz baths taken once or twice a day. From the second day on the finger is inserted every two or three days until firm healing has taken place. I have never seen an anal sphincter rendered either wholly or partially incompetent by this procedure.

SCIENCE IN A TROUBLED WORLD

Amidst the rumble of bombings, the distinguished physiologist and member of Parliament Dr. A. V. Hill[1] addressed the House of Commons. Dr. Hill is uneasy about certain tendencies that have developed in science in his country as they have in ours. A growing tendency for political considerations to exercise an influence on science is viewed with alarm by every scientist. "In order to preserve the integrity of science in our own country," Dr. Hill states, "it is very important that those strong independent scientific bodies should be maintained: and for the sake of international scientific relations it is desirable that in other countries also, so far as we can influence them, the domination of the state over science should be tempered by public appreciation of the part played by independent scientific agencies and institutions." The British spokesman recognizes the importance, indeed the necessity, of scientific organizations within the framework of government. Anent the hazard of government subsidized research he mentioned "the danger that he who pays the piper may call the tune, and that research may be required to be devoted primarily to objects which the politician, or the civil servant, regard for the moment as of national importance." To avoid the evils of this he calls for a powerful buffer to prevent the state from interfering with the integrity and independence of research. Dr. Hill said, in conclusion, "Blessed are they who remain innocently in their laboratories and grumble: for it is a thankless task to get things right. . . . . All we ask is that we should be considered as equals in a common task—not merely as superior technicians paid to dish up the magic which you order."

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CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL
Frank C. Andrus, Pathologist

LUPUS ERYTHEMATOSUS

The case is that of a fifty-two-year-old Jewess who was admitted to the Minneapolis General Hospital on January 31, 1941, and who expired on March 18, 1941. Her presenting complaints were intermittent abdominal pains for the past three years, shortness of breath for the past two or three years, vomiting, and moderate weight loss over a period of the last three to four months. She had apparently been well until eighteen years ago when she became jaundiced. It was discovered at this time that she had syphilis and she received antisyphilitic therapy intermittently for many years. There had been lower thoracic and upper abdominal pains for the past three years of a rather indefinite nature. The attacks of pain were not associated with meals or with exertion. For the past three or four months there had been occasional episodes of vomiting. There had been moderate dyspnea on exertion for many years. All her symptoms had been exaggerated recently. Past history revealed that the patient had had an appendectomy and hysterectomy performed twenty-two years ago. History by symptoms was noncontributory.

Physical examination revealed a well developed and somewhat undernourished white female who was somewhat orthopneic. There were multiple areas of vitiligo on the body and over the extremities. An area of dermatitis was present on both cheeks, upper lips, and the skin. The pupils reacted sluggishly to light and accommodation. The extra-ocular movements were normal. The mouth was edentulous. The ears, nose, and throat were normal. Examination of the neck revealed no abnormalities. Examination of the chest revealed a slight area of dullness to percussion posteriorly and laterally on the right side. Percussion of the cardiac dullness suggested slight enlargement to the left. A harsh systolic murmur was heard over the entire precordium and was more marked over the aortic area. The pulse rate was 92 per minute and the rhythm was regular. The blood pressure was 160/100. Examination of the abdomen revealed no abnormalities save for slight tenderness. Physical examination was otherwise entirely negative.

Laboratory findings.—The urine was amber in color and cloudy and had a specific gravity of 1.019. It was acid in reaction and contained three plus albumin, no sugar, no hyaline casts, occasional granular casts, 20 to 24 erythrocytes, and 20 to 60 pus cells per high power field. The hemoglobin was 43% with an erythrocyte count of 2,600,000, a leukocyte count of 4,600, and a differential count of 96% neutrophiles and 4% lymphocytes. The serologic tests for syphilis were positive. The blood morphology studies revealed an average mean diameter of the red cells to be about 8.1 microns. The red blood cells showed slight to moderate anisocytosis and slight poikilocytosis. The white blood cells appeared somewhat toxic. X-ray examination of the chest at a distance of six feet revealed the heart to be slightly enlarged and of a left ventricular contour. There was no pulmonary pathology. An electrocardiogram revealed left axis deviation and iso-electric T_2. Spinal fluid examination performed at this time revealed the fluid to be colorless and clear and to contain no cells. Serologic tests for syphilis run on the spinal fluid were negative and the colloidal gold showed no curve.

At the time of admission the temperature was 100.4 degrees. Treatment consisted of bed rest, sedation, and anodynes to control pain and discomfort. Iron was administered in the form of ferrous sulphate. The patient was rather unstable emotionally. On March 5, 1941, repeated neurological examinations revealed that the pupils did not react to light and were somewhat irregular. Examination of the fundi revealed hemorrhages in both retinæ and the presence of exudate. It was noted at this time that the patient had a butterfly-shaped erythematous lesion on her face which resembled that of lupus erythematosus. She was given blood transfusions. An March 11, 1941, a Dermatological consultant made a diagnosis of lupus erythematosus. During her entire hospital course there was a daily elevation of temperature varying from normal to 100 or 101 degrees. On March 12 agglutenins for typhoid, paratyphoid, undulent fever, and tuleremia were found to be absent from the patient's blood. The patient's general condition did not improve and on frequent occasions, she was semi-comatose and irrational. On March 5, 1941, a leukocyte count of 10,900 was observed for the first time, and it remained elevated during the remainder of her hospital stay. Blood metabolites showed a progressive retention of nitrogen. On February 10, 1941, the blood urea nitrogen was 9.1 mg. per cent and the creatinine was 1.5 mg. per cent. On two subsequent occasions the blood urea nitrogen was 35.4 and 40.6 mg. per cent respectively, finally rising to 50.4 mg. per cent on March 14, 1941. Several blood cultures were negative. The patient became generally weaker and towards the end of her hospital course, she was almost constantly irra-

tional. Her temperature continued to remain elevated, ranging between 99 and 103 degrees. She expired on March 18, 1941.

Clinical Diagnosis.—Lupus erythematosus and nephritis.

Anatomic Findings (Dr. Frank C. Andrus).—The body was that of a fairly well developed and moderately emaciated white woman. There was a butterfly-shaped area of erythema involving the bridge of the nose and both zygomatic processes. There was also involvement of the skin of the upper and lower lips of a similar process to that found on the cheek. There was another smaller area of erythema in the region of the suprasternal notch. A decubital ulcer measuring 3 cm. in diameter was found over the sacrum. Vitiligo and pigmented areas were seen over the dorsum of the hands and distal one-half of the dorsum of both forearms. There was no edema or cyanosis. A moderately deep jaundice was seen of the skin and scleræ.

The peritoneal cavity was normal. Both pleural cavities were completely obliterated by adhesions as was the pericardial sac. The heart, including part of the pericardium, was not increased in weight. The heart in situ was 13 cm. in its greatest transverse diameter. The myocardium appeared normal. No significant hypertrophy was noted. The aortic, tricuspid, mitral, and pulmonary rings were not increased in circumference. There was no gross valvular deformity. There was moderately severe sclerosis of the anterior descending branch of the left coronary artery and minimal sclerosis of the right coronary artery as well as of the circumflex branch. The arch of the aorta was slightly dilated and its intimal surface presented the characteristic appearance of syphilitic aortitis. The aortic valve was not involved. Both lungs were entirely normal. The spleen was slightly increased in weight. Its capsule was smooth; however, no gross abnormality was seen. The liver was enlarged and showed fatty metamorphosis. The gall bladder and bile ducts were negative. The gastro-intestinal tract, pancreas, and adrenal glands appeared normal.

The kidneys were of normal size. The capsules of both kidneys stripped with difficulty revealing finely and coarsely granular pitted surfaces. There were four or five small petechiæ measuring approximately 2 mm. each in diameter on the mucosal surface scattered about the mucosa of the left renal pelvis. There were no calculi in the urinary tract. The ureters were not dilated and the urinary bladder appeared normal.

There was no lymphadenopathy save for a few small mediastinal lymph nodes containing carbon pigment. The remainder of the examination revealed no abnormalities.

Microscopic examination of the tissues in this disease reveals no typical lesions except in the skin and in the kidneys when the latter are involved. The kidneys present a peculiar and typical lesion, that of a patchy hyaline thickening of some of the tufts of the glomerular capillaries. I have never seen this change in other diseases. This accounts for the albuminuria, etc. The glomeruli are not obstructed enough to cause severe renal insufficiency or marked hypertension. Notice that at one time, the blood urea nitrogen was decreased. This was due to the extreme fatty degeneration of the liver—a result probably of chronic sepsis. There was later oliguria and azotemia developed. The heart valves, myocardium, lungs, and other organs revealed no histologic abnormalities. As Dr. Buehler will point out, the story related above is highly characteristic of disseminated lupus erythematosus. Of particular importance are the cutaneous lesions, the prolonged sepsis, negative blood cultures, the anemia, leukopenia, and urinary findings.

Anatomic Diagnoses.—Subacute, disseminated lupus erythematosus, fatty degeneration of the liver, syphilis of the aorta, adhesive pericarditis, coronary sclerosis, and hypertension.

Discussion

Dr. Martin S. Buehler: Since 1933, when Libman and Sacks first described an typical endocarditis associated with a lupus erythematous-like lesion, it has become increasingly apparent that, while not all cases show an endocarditis, there is a definite clinical entity associated with systemic or disseminated lupus erythematosus. Baehr and Klemperer in 1935 and Keil in 1940 have given excellent reviews of this condition. We wish here to summarize the important clinical findings and to present a case which we believe fits into this entity.

The clinical course is characterized by prolonged and irregular fever and tendency to spontaneous remissions lasting from a few days to several years, by involvement of the serous, synovial, and often mucous membranes, by depression of the bone marrow, by signs of renal damage, and by the cutaneous lesions. The etiology is unknown but the work of Welch suggests a bacterial origin, possibly a streptococcus, in the disseminated form. Tuberculosis is not believed to play any part in the disease. The prognosis is very poor although some of the patients may live for five years after the onset of symptoms. Death usually occurs from bronchopneumonia, renal insufficiency, or toxemia. The disease shows a striking predeliction for females. Twenty-two of the twenty-three cases of Baehr and Klemperer were in women, all of them between the ages of puberty and menopause. The most common disseminating factor is exposure to sunlight, to ultra violet or roentgen rays. In fact, many of the patients present a picture similar to severe sunburn and often give a history of unusual sensitivity to sunlight, and may even date the onset of their symptoms from such an exposure. The disease runs a septic course with a prolonged, irregular, febrile reaction. The temperature, however, may not become elevated for some time after the systemic symptoms occur. The patient may even be unaware of the presence of fever.

The typical cutaneous lesions consisting of an erythematous area arranged in a butterfly distribution over the face and cheeks is usually present and easily recognized. This was present in twenty-two of the twenty-three cases of Baehr and Klemperer. The typical lesion may not appear for some time after the findings of the systemic disease appear. It may be replaced by atypical areas of erythema in various parts of the body and so render the diagnosis more difficult, or the cutaneous lesions may appear several years before the systemic symptoms. The presence of purpuric lesions and telangiectatic areas within the butterfly pattern have also been noted. Polyarthralgia or arthritis, usually without definite evidence of intra-articular destruction,

are usually present. They might, however, precede the cutaneous lesions and in such a case probably could not be distinguished from rheumatic fever, infectious arthritis, or acute rheumatoid arthritis until the appearance of typical skin lesions. The joint symptoms tend to undergo spontaneous remissions with complete recovery in a few days or they may leave residual stiffness or aching after the acute phase.

The kidneys are affected in such a high percentage of cases that this feature must be considered as a definite part of the syndrome. Albuminuria is slight at first but later is two or three plus. A few white blood cells, hyaline and granular casts, microscopic hematuria with occasionally gross hematuria, are the usual findings and are fairly consistent. Azotemia is usually present to some degree, usually moderate because of the patchy distribution of the glomerular lesions. The azotemia may undergo remissions and terminally may become quite marked. Since isosthenuria is usually present, the differential diagnosis from glomerulonephritis may be difficult. The blood pressure is usually normal or only slightly elevated.

The myocardium is usually spared and heart failure is uncommon. The mural or valvular endocardium is involved in almost half of the cases. Patchy or obliterating pericarditis is not an infrequent finding, especially in the presence of verrucous endocarditis, and a friction rub may be heard. Tachycardia is a common finding and the heart is usually very slightly, if at all, enlarged.

The fundi often reveal soft, fluffy exudates, considered by some authors to be collections of edema fluid, and perivascular hemorrhages are often present. Peripapillary edema is usually seen and the eye-ground changes usually undergo spontaneous remissions and may completely disappear. Visual disturbances are uncommon. The serous membranes are commonly involved with pleuritis, pleural adhesions, and pleural effusion. Ascites is rather rarely encountered. Areas of erythema and petechiæ have been noted on the oral mucous membranes and these soon erode and become ulcerative. They tend to heal as the condition improves. Moderate generalized lymphadenopathy is common. The spleen is occasionally enlarged to a moderate degree.

Laboratory Findings.—The urine has already been described. Blood cultures are almost invariably sterile and remain so until terminally when various organisms may invade the blood stream through such portals of entry as trophic ulcers. There is evidence of bone marrow depression with a secondary anemia and thrombopenia with a tendency to purpura and characteristically, a leukopenia with a normal differential count. A few abnormal cells of the myelocytic series may be present in the smear. Terminally, a leukocytosis may appear but this is usually only a moderate elevation.

Pathologically the tissues show the following:

1. The heart in almost half of the cases shows atypical verrucous vegetation both on the valves and mural endocardium. There is a consistent absence of Aschoff bodies and no bacteria can be found on smear or culture. An acute bacterial endocarditis may be present.

2. In the kidneys, Baehr and Klemperer believe the "wire loop" glomerular lesions are specific. They found them in eighteen of their twenty-three cases. These consist of a patchy thickening of the capillary basement membranes in the glomerulus, involving only some of the tufts. There is no typical glomerular nephritis.

3. There is no constant type of vascular lesion but some have described vascular lesions in various organs other than the kidneys.

4. The liver may show enlargement, areas of necrosis, or fatty changes.

Dr. L. H. Winer: The term "lupus erythematosus" is a very poor one to apply to this condition for when we say "lupus" we usually think of something tuberculous. In the chronic type there is at first no disturbance to the patient's general health. One has the impression of a sunburn when the patient is first seen. However, the sunburn persists and strangely, many give the history of having been fishing or otherwise exposed to the sun. It is important to examine the mucous membranes for they are not exposed to the sun and if they are involved, you will know that you are not dealing with a simple sunburn. Those edematous, reddened areas are not only seen in the mouth. I remember one patient who had lesions only on the labia and vagina. Sometimes the patient with subacute lupus erythematosus will pass into an acute form just before death. The etiology of this disease is entirely unknown. It is not tuberculous and animal inoculations are all negative. We have no specific treatment. It is one of the fatal skin conditions. We put the patients to bed, keep the room dark and the patient quiet and comfortable; and that seems to be as much as anyone can do.

APPEAL FOR MEDICAL FUNDS IN CHINA

The University Hospital of Nanking, which is run by the University of Nanking and is one of the thirteen colleges in China supported by the Associated Boards of Christian Colleges in China, during the last six months handled an average of 9,702 patients in its wards and clinic, and in addition carried out 185 major operations. The total operating expense for one month was $200 in American money. The doors of the hospital have served rich and poor alike during bombing, siege and Japanese occupation. Training of interns and nurses has continued in spite of difficulties.

The Association Boards and United China Relief have recently issued an appeal for funds to maintain and develop the medical work of the Christian Colleges in China.

Contributions may be made to Artemus L. Gates, Treasurer, United China Relief, 1790 Broadway, New York, N. Y.

HOMEOPATHIC AND ECLECTIC MEDICINE IN MINNESOTA*

By James Eckman

Rochester, Minnesota

(Continued from August issue)

Homeopathic Literature

Minnesota Medical Mirror.—This publication was eclectic in inclination, but it published papers and reports representing all schools of medicine. It was edited and owned by Dr. Nereus M. Cook (1852-1927), who in 1881 was living in Cambridge City, Minnesota. It cost $1.00 a year. Single copies cost 10 cents each. First issue of the *Mirror* was dated December, 1881. With the issue for October, 1884, the journal was published in Minneapolis, and the last issue was the one for March, 1885. Four volumes in all were published. After publication of the issue for October, 1883, at Cambridge, the *Mirror* was suspended. It next appeared in October, 1884, and was issued in Minneapolis by the Medical Mirror Publishing Company. Two associate editors were appointed by Dr. Cook: Dr. E. L. Stevens and Dr. Charles Sidney Stoddard (1846-1928), both of Minneapolis. Dr. Stoddard had been a classmate of Dr. Cook at the Bennett College of Eclectic Medicine and Surgery of Chicago in the class of 1874. The *Minnesota Medical Mirror* consistently urged the establishment of harmony among all schools of medicine: it spoke well of the old *Northwestern Lancet* of Saint Paul, reprinted papers from other "regular" medical journals, and published the notices and occasional papers of the Minnesota State Eclectic Medical Society. In October, 1882, an interesting paragraph was printed in the *Mirror*:[59]

> JOURNAL OF AM. MED. ASSOCIATION.—If 2,000 subscriptions are promised the publication of this journal will be undertaken. It will be a good idea. Members of the Association who pay their annual dues will receive it free. To others the price will be $5.00. Address Prof. N. S. Davis, Chicago.

Dr. Cook apparently thought he had instituted the second medical journal to be published in Minnesota. He credited the *Northwestern Lancet,* begun by Dr. Jay Owens (1852-1890) in 1881, as being the first medical journal in Minnesota; he considered his own to be the second.[60] This was an error. The *Minnesota Homœopath,* started in 1858 or 1859, was the first, and the *Northwestern Medical and Surgical Journal* of Dr. Alexander J. Stone (1845-1910), founded in Saint Paul in 1870, was the second medical journal in Minnesota.[61]

Northwestern Medical Journal.—In referring to this particular journal the author believes that he is on insecure ground, for the *Northwestern Medical Journal* was but one title of a single publication which had, during its existence, no less than seven names. The *Northwestern Medical Journal* apparently was

started in Newark, New Jersey, in August, 1874, as the *New Jersey Eclectic Medical and Surgical Journal.* It retained this title through October, 1876. In June, 1877, the publication was resuscitated (by the same editor) as the *New York Eclectic Medical and Surgical Journal.* The last issue of the journal under the aforementioned name was the one for February, 1880. In March, 1880, it became the *New York Medical and Surgical Journal* of New York City, and it retained this title through the issue for May, 1881. In June, 1881, it was styled the *New York and Chicago Medical and Surgical Journal,* and it remained so through the issue for October, 1881. Armstrong[62] wrote that the *Minnesota Medical and Surgical Journal* was printed in Minneapolis from the issue of August, 1886, through March, 1887. In 1889 this publication became the *Minnesota Medical Journal,* and Armstrong[62] wrote that only one issue bearing this title was published. From 1889 to 1895 the journal was called the *Northwestern Medical Journal,* and the last issue of it supposedly was the one for January, 1895. More research will have to be done before the true dates of issuance and correct titles of the several magazines which culminated in the *Northwestern Medical Journal* can be established.

The editor and publisher of the journals listed in this particular section was Dr. Edward N. Fishblatt (?-1898). He was not a physician much esteemed by his fellows, it would appear, for on August 1, 1887, he was disbarred from the practice of medicine in the Territory of Dakota "for gross unprofessional conduct, advertising and quack methods."[63] He had been licensed in the territory on September 24, 1885, and at that time he said he had been graduated from the Eclectic Medical College of the City of New York on February 8, 1868. His residence at the time of registration in the Territory of Dakota was Janesville, Rock County, Wisconsin.[63] On page 38 of the *Minnesota Medical Mirror* for January, 1883, as a testimonial for Richardson and Company, Wholesale Druggists, of St. Louis, Missouri, the following letter was reproduced:

> CEDAR RAPIDS, IA., Dec. 13, 1882.—I have been using "Celerina" in my practice very extensively for two years, *and in sexual debility and nervous diseases it produces excellent effects.* Think I have used at least one thousand bottles.
>
> E. N. Fishblatt, M.D.

Fishblatt apparently had ceased to publish the *New York and Chicago Medical and Surgical Journal* in October, 1881; if he was in Iowa in December of 1882, as the aforementioned letter would indicate, it is probable that he was not issuing a medical journal of any kind at that time.

Dr. Fishblatt's name appears in the Minneapolis city directory in 1889, and in that year he had an office at his home at 910 Sixth Avenue South. In 1890 in the Minneapolis directory he listed himself as "Ed. Med. Journal," and he was still at the same address. On March 26, 1894, his wife, Mary Fishblatt, died of meningitis at the residence at 910 Sixth Avenue South, and Dr. Fishblatt thereupon moved to 251 Bank of Minneapolis Building at Third Street and Nicollet Avenue. In 1896 he had an office and residence at 830 Fourth Avenue South, and in the 1898 city directory he is listed as "deceased." Nothing more at present is known of his life and career, excepting that in 1894 he bought a lot (number 96 in section 12) in Lakewood Cemetery in Minneapolis for interment of the body of his wife, Mary Fishblatt.[64] Mr. W. K. Larsen,[64] of the Lakewood Cemetery Association of Minneapolis, has reported that the body of Dr. Fishblatt is not interred in Lakewood Cemetery.

The Minnesota State Eclectic Medical Society

Armstrong[3,48] has shown that two years after the foundation of the Minnesota State Homœopathic Institute in 1867, the Minnesota State Eclectic Medical Society was incorporated, the date being May 26. Eli Martin Morehouse (1835-1891) of Owatonna was elected president of this society, S. M. Morrison was chosen vice president, N. L. Culver was made recording secretary; L. F. Case was elected corresponding secretary, and Charles Lee was treasurer. On November 14, 1869, the Southern Minnesota Eclectic Medical Society was incorporated, and Armstrong[48] said that it was a larger society than the state eclectic body. The Minnesota State Eclectic Medical Society was still in existence in December, 1881, when Dr. Nereus M. Cook (1852-1927) began to publish his eclectic *Minnesota Medical Mirror* at Cambridge City, Minnesota. On May 30, 1883, at Owatonna, the state eclectic society held its fifteenth annual session in the opera house of that city, and it would appear that Morehouse was again elected president of the society.[65] A resolution was adopted which urged the Board of Regents of the University of Minnesota to "give the eclectic or reform system of medicine a representation in the faculty of the University," and Dr. Theodore L. Hatch (1848-1913) of Owatonna, Dr. R. F. Lynch and Dr. T. A. Caldwell were elected delegates to the convention of the National Eclectic Medical Association which met at Topeka, Kansas, on June 20, 21 and 22 of 1883. When the Minneapolis College of Physicians and Surgeons was founded in 1883 Cook[66] hailed the news in the *Minnesota Medical Mirror* with "Another medical educator. Hurrah for this great state! Next in order is an *eclectic* medical college." Dr. E. L. Stevens[67] of Minneapolis observed in 1884:

> There is no one thing that would do as much to awaken an interest in this matter [eclecticism], as an Eclectic college in the Northwest. At present, if a young man wishes to secure a medical education, and is Eclectic in his views, he must either go to Chicago, or attend the Allopathic college in this city. Nebraska Eclectics have demonstrated their enterprise by securing a school in connection with the State University.* Perhaps we cannot do the same in this state, but we might inaugurate the work in time to commence the first term next fall.

So far as the author is aware, eclectic medicine and surgery were never taught at the University of Minnesota. As for the Minnesota State Eclectic Medical Society, the year of its dissolution is unknown. It seems to have been a fairly well-maintained organization, however, since it elected and sent delegates to the National Eclectic Medical Association** at least once.

Certain Homeopathic and Eclectic Pioneers†

On the wall of the west grand stairway of the House of Representatives in the Capitol at Washington, D. C., is a fresco painting by Emanuel Leutze (1816-1868) called "Westward the Course of Empire Takes Its Way," after a line from the ode to America by the great English metaphysician and Anglican

*This was the University of Nebraska College of Medicine, Eclectic Department, at Lincoln. The department was organized in 1883 and became extinct in 1885.

**There is evidence that this association is still in existence. On May 7, 1941, Dr. William D. Cutter, secretary of the Council on Medical Education and Hospitals of the American Medical Association, advised the writer that Dr. Jesse Kersey Bailey (1888-) is president of the National Eclectic Medical Association.

†Some of the biographic material to follow appears in print for the first time. Dates of birth and death are those which have been published in the *Journal of the American Medical Association* when that journal was able to obtain data pertaining to the men concerned. In other cases, dates of birth have been obtained from the Minnesota State Board of Medical Examiners, clerks of district courts, known relatives of deceased physicians, histories of cities or counties of Minnesota, the United States War Department, the United States Veterans' Administration, newspapers, and in instances in which distance was not a prohibitive factor, from the results of personal visits by the author to certain towns and cemeteries in the vicinity of Rochester. The assistance of Dr. John M. Armstrong of Saint Paul has been invaluable.

clergyman, George Berkeley (1685-1753), who, it is interesting to notice, conceived the idea that tar water was a specific for smallpox, pulmonary tuberculosis, pleurisy, erysipelas, asthma and other conditions, while he was an evangelist in Rhode Island from 1729 to 1732.[68] The painting in question has been called an artistic failure, and has been adversely criticized with great vigor; but it has been said[69] that President Lincoln liked it well enough to visit the Capitol at odd moments to see how Leutze's work was progressing. In respect to the state of Minnesota this allegorical painting, good or bad, typifies in striking manner the exodus of settlers from New England and the Atlantic Seaboard and their interminably slow journeys to the tablelands beyond the Mississippi River. The influence of New England emigrant-physicians on the practice of medicine in Minnesota is considerable. It is true that other influences were operative. In Saint Paul the early practitioners were French, German and Yankee; in some regions, and especially in the town of New Ulm, nearly all the early physicians were Germans. In still other sectors, as in the settlements of Silver Lake and Montgomery, Bohemian practitioners were the first to predominate. The South is scarcely represented in the early medicine of Minnesota, and the Great West is negligible as an influence. The work of surgeons attached to the United States Army in the pioneer territory cannot be passed by lightly, nor can the chiefly unsung labors of physicians who entered the state as members of various expeditions by early explorers be dismissed. It may be pointed out, also, that as late as 1881 and 1882, during the great epidemic of smallpox which swept over Minnesota in those years, enlightened priests in many sections of the state courageously offered their services to the Minnesota State Board of Health and acted as vaccinators in regions in which the settlers otherwise would have had no medical care at all. In the main, however, the weighty influence of New England emigrant-physicians cannot be denied. That influence apparently was wielded by early homeopathic and eclectic physicians as well as by the so-called regular practitioners, as will be shown in the ensuing pages.

One of the hardiest progenitors of homeopathy in Minnesota was, oddly enough, neither a physician nor a homeopath. He was a dentist. **Abner Laycock Bausman** was born in Ebensburg, Pennsylvania, in 1834. He was educated in the manner of most denizens of the rural districts in the early days of the last century, and studied dentistry under the preceptorship of a dental surgeon in Pittsburgh. There is no record that Bausman ever attended a dental school or a medical college. In 1856 he came west to the Territory of Minnesota, settling near Mankato. A year later he came to the struggling frontier village of Minneapolis, which was still of such uncertain destiny that the town of St. Anthony (now East Minneapolis) on the east bank of the Mississippi River was separated corporately from it.

In Minneapolis the twenty-three year old dental surgeon opened an office on what is now Second Avenue South, between Washington Avenue and Second Street. "A. L. Bausman, dentist," wrote the younger Leonard,[70] "ministered to nearly all the early citizens of prominence, and was always an important political factor." As the burgeoning pioneer community expanded with the opening of the great Northwest to the railroads, Bausman became an influential citizen. He was a voluble Republican, resident in a state which from the election of 1859 to the election of 1898 chose none but Republicans as chief executives. He was a power in early Minneapolis politics, and there is reason to believe that he was an important influence in state political circles.

Bausman helped to found the Minneapolis Athenaeum, now the Minneapolis

Public Library. He was an enthusiastic advocate of the homeopathic system, and was well known throughout the state for his efforts in behalf of *similia similibus curantur*. He moved to an office at 242 Nicollet Avenue in 1870, an action that brought him into intimate association with most of the homeopathic physicians of the day, who leased headquarters in that section of downtown Minneapolis. Hamilton[43] has recorded the fact that in 1882 and 1883 Bausman was secretary of a "Homeopathic Hospital" of Minneapolis; in 1886 he was chairman of a committee of five members which drew up articles of incorporation for the Minnesota Homœopathic Medical College and provided for the issuance of the *Minnesota Medical Monthly*.[50] On May 21, 1886, he was chosen a trustee of the medical college. He was also elected vice president of the Minneapolis Homœopathic Hospital, then situated at 2446 Fourth Avenue South, and in 1888 was awarded the honorary degree of Doctor of Medicine by the Minnesota Homœopathic Medical College.

Aldrich[36] wrote that after physicians of the dispensary staff of the Minneapolis Homœopathic Medical College organized the Minneapolis Clinical Society early in the eighties, interest in the society lagged, and the organization slipped into desuetude. Dr. Bausman revived the group, and meetings of it were held in his dental office at 242 Nicollet Avenue. It soon became known as "Dr. Bausman's Clinical Society," according to Aldrich,[36] and homeopaths from all parts of the state attended its sessions.

Dr. Bausman was in every sense a pioneer. He was one who helped to usher in homeopathy in Minnesota, and he lived long enough to witness the decline and virtual disappearance of the system of medicine which he had for years served so arduously. He died at his home at 2540 Pleasant Avenue in Minneapolis on August 29, 1911.[71]

In East Minneapolis (St. Anthony) **Dr. William A. Penniman** (1802-1872), who was graduated from the "regular" Jefferson Medical College of Philadelphia in 1827, began to practice in 1856.[6] Aldrich[36] said that during the devastating epidemic of smallpox which afflicted Minneapolis and St. Anthony in 1857 Dr. Penniman lost not a single patient. Born in Albany, New York, on October 18, 1802, Penniman had been trained as a so-called allopathic physician, but had turned to homeopathy while he was practicing in Pittsburgh in about 1846. He was the first president of the Minnesota State Homœopathic Institute, and at his death in Elizabeth, Pennsylvania, on March 10, 1872, bequeathed a considerable sum of money to his homeopathic colleagues in Minnesota, as has been shown.

In Minneapolis proper the first homeopathic physician was said by Aldrich[36] to have been **Dr. Philo L. Hatch** (1823-1904), who came to Minnesota from Dubuque, Iowa, in 1858. He had been graduated in 1857 from the old Homœopathic Hospital and College of Cleveland. He was one of the sixteen founders of the Minnesota State Homœopathic Institute, and was elected president of that organization in 1875. In 1875, also, he was president of the Hahnemann Medical Society of Hennepin County, and corresponding secretary of the Minnesota Academy of Natural Sciences. In 1880, he was elected president of the academy. He served as first dean and professor of obstetrics of the Minnesota Homœopathic Medical College, opened on October 4, 1886. He was also vice president of the board of trustees of that institution. Aldrich[36] said that Dr. Hatch was the first ornithologist of the University of Minnesota. In 1887, Dr. Hatch was forced to leave Minnesota because of the precarious health of his wife, and he

went to California. In 1891, he wrote *Notes on the Birds of Minnesota,** a 481-page work. Dr. Hatch died at Santa Barbara, California, on May 21, 1904.[72]

William Huntington Leonard, easily the outstanding figure in the history of homeopathy in Minnesota, was born on December 2, 1825, in Mansfield, Tolland County, Connecticut. His father, Dexter M. Leonard, was the son of a well-known physician of Ashford, Connecticut. Aldrich[36] wrote that the first Leonards to come to America were James and Henry Leonard, who settled in Taunton, Massachusetts, in 1652, and there erected the first forge in America. Young Leonard worked on his father's farm, achieved his education at a select school, and then taught school for six years. He finally decided to become a physician, and began to study medicine under the preceptorship of Dr. Orrin Witter, of Chaplin, Connecticut. He spent the winters of 1850 and 1851 at the University of New York, and was graduated as a "regular" physician from the Medical Institution of Yale College in 1853. For the next two years he practiced in Orangeville, in Wyoming County, New York.

Dr. Leonard came to Minneapolis in 1855, where on June 20 he helped **Dr. A. E. Ames** (1814-1874), found the old Union Medical Society of Minneapolis and St. Anthony. He proclaimed himself a convert to the homeopathic system of medicine in 1859 or 1860, but was still a member of the Union Medical Society in 1862.

The younger Leonard[70] revealed that his father had been a partner of **Dr. Charles L. Anderson,** who, as both Hamilton[73] and Flanagan[74] have pointed out, was the physician with whom Henry David Thoreau (1817-1862) was associated when the author of *Walden* came to Minnesota in the last years of his life suffering from pulmonary tuberculosis. Dr. W. H. Leonard and Dr. Anderson were partners in the period in which Leonard was a "regular" physician; which is to say, before 1859 or 1860. Dr. Anderson was recording secretary of the old Minnesota Medical Society which was organized in Saint Paul on Saturday, July 23, 1853,[75] and was said to have left Minneapolis for Carson City, Nevada, on May 13, 1862. He published "Agriculture West of Minneapolis" in the old *Minnesota Democrat* for the issue of October 25, 1856, and appears to have been a genuinely learned man.[73] As Dr. J. M. Armstrong once remarked to the author, a thorough study of Dr. Anderson's life and career no doubt would be productive of considerable interest.

Another piece of information presented by the young Leonard was the fact that "My father, Dr. William H. Leonard, and Mr. Schuyler Johnson, Mrs. Andrew Rinker's father, lived in the south side of Second street near Hennepin avenue, in buildings which are now [1915] a hide store . . . "[70]

In 1860, Dr. Leonard became the partner of Thomas Gardiner, in a drug business.[31] During the War of the Rebellion he was assistant surgeon to the Fifth Minnesota Regiment, and was the messmate of Archbishop John Ireland, who at that time was a young priest serving as chaplain to the regiment. Dr. Leonard was discharged from the United States Army at Fort Snelling in 1865, and according to his son,[70] brought to Minneapolis a great white charger called "Charlie," which he had ridden throughout the siege of Vicksburg. He also had with him another horse and a queer old Negress called "Aunt Hester

*This book was published in 1892 as volume 1 of the Zoölogical Series of the Geological and Natural History Survey of Minnesota, and is still consulted by ornithologists. It may be found in Henry F. Nachtrieb's *First Report of the State Zoölogist, Accompanied with Notes on the Birds of Minnesota, by Dr. P. L. Hatch,* Minneapolis, Harrison & Smith, Printers, 1892. It occupies almost the whole of Nachtrieb's report.

Patterson," whose strange dialect and energetic mannerisms caused natives in East Minneapolis, where she lived, much astonishment and some chagrin.[70]

In 1867, Leonard lived at Fifth and Helen Streets in Minneapolis, and his office was at No. 2 Center Block, on Hennepin Avenue between Washington Avenue and Second Street. In this building he operated "W. H. Leonard & Company, Druggists." By the year 1874 he had moved both his office and his place of residence to a house at 424 Second Avenue South and he conducted his practice at this address until 1887, when he opened an office at 409 Nicollet Avenue.

"He was the first health officer who introduced the vital statistics of the city [Minneapolis]; also the first commissioner of the State Insane Examining Board," Aldrich[36] wrote of Leonard in 1893. Hamilton[76] wrote that Leonard became health officer of Minneapolis in 1869 and held the post until 1872. In 1875, Governor Cushman K. Davis (1838-1900) appointed Dr. Leonard to the Minnesota State Board of Health, a position he held for almost a quarter of a century.

He was much interested in the Minnesota Academy of Natural Sciences, which he helped to found in January of 1873, and in 1875 he gave to the academy his collection of bones and stone implements which he had obtained from Indian mounds at Lake Minnetonka.

Evidence exists which would suggest that Dr. Leonard in 1867 almost single-handedly founded the Minnesota State Homœopathic Institute. In the *Transactions* of the state body is the statement that on February 14, 1867, the recording secretary of the convention which organized the institute was directed to pay to Leonard the "sum of $4 (four dollars) expended by him for printing circulars, and postage."[77] Such a statement would indicate that if Leonard did not himself conceive the idea of establishment of the state society, he at least was responsible for calling the homeopathic practitioners of the state together, and for supervising printing and mailing of the call which was sent out to them.

The Hamiltons[33] said that the founding meeting of the Hahnemann Medical Society of Hennepin County was held in Dr. Leonard's office on September 16, 1872, and that Dr. Leonard was elected first president of the society. In 1887 and 1888 he was again president of this society, and on December 3, 1887, Dr. John A. Steele, at a meeting of the organization, presented to Dr. Leonard a gold-headed cane in behalf of the homeopathic practitioners of the city.[78]

Dr. Leonard practiced medicine with his son, **William Edwin Leonard** (1855-1935), after the younger man had been graduated from the Hahnemann Medical College and Hospital of Philadelphia (1879), and had returned to Minneapolis after a year's internship at Ward's Island Homœopathic Hospital in New York City. The father was licensed to practice medicine in Minnesota on October 15, 1883, and the son obtained his license in November of the same year.[79]

In 1903, the homeopathic practitioners of the city of Minneapolis tendered a banquet to Dr. W. H. Leonard on the occasion of the fiftieth anniversary of his entrance into the practice of medicine in 1853. Elbert Hubbard (1859-1915) and Mark Twain (1835-1910) sent congratulatory telegrams to the aged practitioner,[80] and in reporting the celebration the "regular" *Northwestern Lancet* of Minneapolis paid tribute to the "silent influence for good of these fifty years" which he had exercised. The journal added, "It is the wish of the *Lancet* that Dr. Leonard may live to celebrate the 75th anniversary of his practice."[80]

The wish of the *Northwestern Lancet* was never realized. Dr. W. H. Leonard died in Minneapolis on April 9, 1907, fifty-two years after he had first set foot on the muddy streets of the then sprawling frontier hamlet. "Dr. Leonard was an exceedingly popular physician," observed the *Journal of the Minnesota State Medical Association and the Northwestern Lancet,* "successful, skillful, genial, and conscientious in whatever work or study he undertook. When he became a homeopath he carried out the Hahnemann idea faithfully and persistently. He was true to his principles and sincere in his beliefs."[81]

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*References 1-18 appear in the June issue, page 479; 19-37 in the July issue, page 572; 38-58 in the August issue, page 674.

(To be continued in the October issue.)

President's Letter

ARE WE VULNERABLE?

AMERICA owes its prominence among the nations of the world not to the mind primarily of one man but to the combination of the thoughts of many strong men working for the good of the whole. The Constitution of our United States was not the work of a day or two or a week but the result of many days and weeks of sincere and conscientious deliberation by many men. Out of this came a remarkable document which we all enjoy because of its fine phraseology expressing the ideas of master minds who thought up and put together the document with a clear discernment of future needs.

Today we find prepayment medical care plans springing up all over the country primarily fostered by lay people for mercenary reasons who have little or no thought specifically for the good of the people and certainly are not concerned with the present position or future well-being of the medical profession.

Someone has said that if you wish to sell questionable securities or other "get-rich-quick" schemes, be sure and see the professional men of the community first; and one sometimes wonders whether this is not justified when we see men of our profession in the best of standing condoning prepayment medical care schemes without exercising the judgment which comes from consulting with those who are in a position to pass on their worth or merit.

It has taken years to build up our present patient-physician relationship. No one man or any number of men should consider themselves so strong that they can break it down. If we in this state go into schemes such as have been proposed, with all their complications, we may find ourselves slain by a boomerang of our own throwing when people who purchase so-called protection find that it is at an exorbitant price and that the service rendered is of mediocre quality.

Hospital service organizations are successful because their control has remained within the hospitals themselves, service being considered first, self-gain relegated to second place.

Prepayment medical care will be likewise successful if its control remains within the profession.

It is paramount that changes of all kinds must of necessity come from within ourselves, not be forced upon us from without by those who do not understand our problems. In Minnesota all plans must be applicable, state wide, and not reserved for the few.

Sometime in the future after study, study, and more study, a plan will be evolved by minds within our association which will embody all the good features which are desirable for our people and ourselves and eliminate those things glaringly wrong in many present schemes now being foistered on an unsuspecting public and ourselves.

B. J. Branton, M.D., *President*
Minnesota State Medical Association

Editorial

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BUSINESS MANAGER
J. R. Bruce

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THE EPIDEMIC OF ENCEPHALITIS

THE epidemic of encephalitis which is afflicting our state and North Dakota and to a lesser degree South Dakota, Iowa and even Manitoba is of serious concern to the profession. The first article in this issue, by C. M. Eklund of the Division of Preventable Diseases of the Minnesota State Board of Health, should prove of interest to our readers.

The 600 odd cases of encephalitis reported to date include cases suspected by the reporting physicians; the profession being encephalitis-minded it is safe to assume that as many as 50 or 60 per cent of those reported are not encephalitis. On the other hand many cases have doubtless been overlooked because of the inherent difficulty in the diagnosis of this disease. One fact is certain—that an epidemic exists.

Physicians have been asked to send blood specimens to the State Laboratory for neutralization tests. This they have been doing, which has taxed the ability of the laboratory beyond its powers and reports have, therefore, been delayed and will continue to be delayed, although they eventually will be forthcoming. When one considers that it requires twelve or sixteen mice to perform one test, the total volume of work required of the laboratory is indicated. The accuracy of the neutralization test is limited by the fact that a certain percentage of the adult population, perhaps as high as 25 per cent in the case of the St. Louis variety, show a positive test in the absence of any clinical symptoms. A negative test within the first few days of the onset of the symptoms, followed by a positive test a week or more later, would thus be more reliable. The neutralization test is therefore only an adjunct to the clinical diagnosis of the disease.

Knowledge of the epidemiology of encephalitis is woefully lacking. The present type of encephalitis is a distinctly different disease from the post-influenzal encephalitis. The post-influenzal type seemed to attack young adults for the most part, was characterized by ophthalmoplegia, and resulted often in prolonged cerebral sequellæ. The disease appeared in spring and winter. In 1933, and again in 1937, St. Louis was afflicted by a type of encephalitis different from the post-influenzal and also different in some respects from the present encephalitis disease, which is due to a virus identical with that causing the disease in horses and therefore known as the equine variety. This is further divided into the eastern and western varieties. The western variety is the less severe and is fortunately the type of disease we have with us. It affects all ages, is not characterized by ophthalmoplegia, and sequellæ are not outstanding. The mortality is around 10 per cent. It is prevalent in the summer and early fall and disappears with the coming of frost.

Although known as the equine variety of encephalitis the relation between human and equine infection is not at all clear. Although it is known

that a mosquito feeding on a virus-containing brain or an animal sick with the disease after a seven-day period of incubation can infect another animal by its bite and that a mosquito might carry the infection after biting a horse during the first day or two of its sickness, the relationship of horse, mosquito and man infection is not so simple. This is shown by the fact that in 1937 there were about 45,000 horses sick with equine encephalitis in the state and again in 1938 some 28,000, and yet we had no human epidemic. This year only some 2,000 horses have been afflicted and the distribution of these equine cases does not closely correspond to that of the human cases.

Another strange characteristic of the present epidemic is the almost state-wide distribution of cases, the great majority being in the country districts. Few have been reported from the larger cities. Frequently only one of two cases are reported from the same locality.

We know certain facts about this encephalitis. We know it is a virus disease, one characteristic of which is that the organism requires living cells for perpetuation. When the host and the method of spread are understood, we shall be able to eliminate the disease. To determine this requires funds. A few thousand dollars at this time would tide over the investigative type of work being done now by the State Board of Health, funds for which at the present writing are lacking.

INTERNATIONAL MEDICAL ASSEMBLY

ONE of the largest medical meetings of the year is the International Medical Assembly of the Inter-State Postgraduate Medical Association of North America. This has been true for two decades or more. This year the Assembly meets in Minneapolis for five full days beginning October 13.

The meetings will be held in the Minneapolis auditorium and will continue through each evening except Wednesday, when the annual assembly dinner for members and ladies will be held.

The Saturday preceding and the one following the Assembly will be devoted to clinics to be held in the Minneapolis hospitals. These are being arranged by Dr. T. J. Kunseth and Dr. A. C. Kerkhof. Dr. Charles E. Proshek is local chairman of the Minneapolis committees.

News of the death, August 20, of Dr. William B. Peck of Freeport, Illinois, for years the managing director and dynamic force which has been responsible for the success of the Assembly, will be a shock to the many physicians of the Northwest who knew him. Dr. Arthur B. Sullivan of Madison, Wisconsin, who for several years has been Dr. Peck's right-hand man, will be acting managing director for the Minneapolis meeting.

The complete scientific program of the Minneapolis Assembly appears in this issue of the JOURNAL. It is perhaps needless to say that an unusual opportunity will be afforded physicians of Minnesota and the Northwest to see and hear many of the outstanding clinicians of Canada and the United States.

THE PUBLIC HEALTH EDUCATION COMMITTEE OF THE STATE MEDICAL ASSOCIATION

THIS reorganized committee held a well attended meeting in Duluth on Saturday, July 19. As now constituted, this committee is a disseminating agency for any and all information the active research committees, such as tuberculosis, diabetes, fracture and cancer, desire to publicize. The chairmen of these respective committees are thereby members of the general committee on Public Health Education.

The committee's chief agencies for publicity include. "The Subject of the Month" program, College Lecture Courses, Weekly News Services, and Dr. William A. O'Brien's invaluable radio programs. The first avenue is primarily for doctors. It was pointed out that if the contents of the packets are to be utilized by such lay teaching agencies as public health nurses, the editing thereof must keep in mind the scope of training and understanding to which nurses attain. The second group, of College Lectures, aims to reach the teachers as well as college level groups, and must compete with the massed slugs of compressed intellectual pabulum fired at students by most professors.

The third agency invites those vending news to make use of as much as they wish of available information and material. In proportion as it is newsworthy it is noticed. It is difficult to know beforehand the items that help sell news. For example, encephalitis among horses in Fargo made but a minor appeal; but if a harassed police chief in a large city may implement his possibility gangster-threatened position with an en-

cephalitic brainstorm, it may help divert political lightning from metropolitan Minnesota to the Dakota wheat fields. The fourth (radio) outlet, so long as Dr. William O'Brien devotes his charm and versatility to it will, of course, outstrip all the rest. He invites suggestions not only from our committee but from you who read and listen, as well. Either write to Dr. O'Brien at the University, or to Mr. Rosell at the Society office in the Lowry Building, Saint Paul. All channels of propaganda and opinion building are running at flood tide. As the stream tones down in more peaceful days to come, we may hope that permanent values will profit by listening habits acquired in blitzkrieg cycles.

—E. L. T.

ALCOHOLICS ANONYMOUS

THE unusual organization known as Alcoholics Anonymous is what its name implies and is made up of former alcoholics whose membership is not made public. The organization has no officers and no dues and its sole purpose is rescuing unfortunate alcoholics from their deplorable condition.

The majority of human beings can take one drink and stop there. A small percentage of individuals, but by no means a negligible number throughout the length and breadth of our country can't drink in moderation and make up the group known as alcoholics, dypsomaniacs or just plain "drunks." These people keep deluding themselves with the idea that they can drink in moderation, and they become a problem to themselves as well as to their relatives and friends. They periodically have an inexplicable and irresistible craving for a drink and they are off on a bout. Alcohol may have a different effect on these individuals than on the rank and file, but the psychic element plays an important rôle. It is claimed that many of them seek escape from unpleasant reality in the numbing effect of alcohol.

The alcoholic has always been a problem and doubtless always will. Various methods of treatment have been applied—legal, medical, psychic and religious. By and large, the results have not been very satisfactory.

Alcoholics Anonymous takes a somewhat different approach to this important and difficult problem. Doctors have realized that medicine can do nothing permanently for these unfortunates unless the individual wants to cease drinking. He must not only want to stop for the time being but he must be convinced that he cannot drink in moderation and must admit that total abstinence is the only answer to his problem. Alcoholics Anonymous realizes this fact but adds to it the helping hand of a group who have known the difficulties from personal experience.

The organization was started in 1934 in Akron, Ohio, by a local physician and a New York broker, both alcoholics, who conceived the idea of helping others. The organization has spread all over the country, having various sized groups in many of the larger cities, including the Twin Cities.

The psychology associated with Alcoholics Anonymous is interesting. In the first place the down-and-outer must admit that he cannot fight alcohol alone and must seek assistance. The physician may be needed in an individual case to supervise a period of sobering up before cerebration is reëstablished. Then, if he so desires, a note dispatched to P. O. Box 3452, Saint Paul, or 594, Minneapolis, will bring two or three members of the organization to call on him and reach a helping hand. If he means business he will be called on frequently and may attend group meetings, where he feels the psychic strength incident to the group. One or two episodes of backsliding may be tolerated, but he is dropped from membership in case of repeated offenses, for one of the purposes of the society is the acquiring of new members and assisting another alcoholic gives added strength to the members.

Alcoholics Anonymous is so obviously what it pretends to be, is so free from monetary consideration, being supported by occasional gifts and the sale of a book by the Alcoholic Foundation, and gives such opportunity for the spiritual, religious, and economic rehabilitation of these unfortunates, that the medical profession should know more about the organization and coöperate whenever possible. Literature in the form of a pamphlet and a book entitled "Alcoholics Anonymous" are obtainable from The Alcoholic Foundation, P. O. Box 658 (Church Street), New York City.

RETURN YOUR INFORMATION CARD FOR THE DIRECTORY PROMPTLY

About September 1, an information card was sent from the headquarters office of the American Medical Association to every physician in the United States and Canada. The information secured is to be used in compiling the Seventeenth Edition of the American Medical Directory.

The directory is prepared at regular intervals in the Biographical Depatmernt of the American Medical Association. The last previous edition appeared in 1940. This volume is one of the most important contributions of the American Medical Association to the work of the medical profession in the United States; it has been especially valuable in the medical preparedness program. In it, as in no other published directory, are dependable data concerning physicians, hospitals, medical organizations and activities. The directory provides full information concerning medical colleges, specialization in the field of medical practice, memberships in special medical societies, tabulations of medical journals and medical libraries and, indeed, practically every important fact concerning the medical profession in which any one might possibly be interested.

Before filling out the information card, read the instructions carefully. Physicians are especially urged to state whether or not they are on extended active duty for the medical reserve corps of the United States Army and Navy. Fill out the card and return it promptly whether or not a change has occurred in any points on which information is requested. If a change of address occurs before March 1, 1942, report it at once. Should you fail to receive a card before the first of October, write at once to the headquarters office stating that fact and a duplicate card will be mailed.

Says Nature to Physic what pity that we
Who ought to be friends should so seldom agree.
With medical legions my humours they chase,
Till pallid resentment appears on my face;
Aperients, astringents, narcotics, combine
To thwart and oppose me in every design;
And by volleys of pills discharg'd at my head
My strength is exhausted, my energy dead.
But Physic should know I am not to be taught
By severe flagellation to do as I ought;
That my faults may be mended by gentle correction
To which science and talents must give the direction.

—Nature and Physic, Professional Anecdotes, 1825
Rep. in Can. Med. Assn. Jour., July, 1939.

Communication

STATE DEPARTMENT OF HEALTH

To the Medical Profession of Minnesota:

At the request of the Minnesota State Medical Association the State Board of Health is coöperating in the conduct of a state-wide maternal mortality survey to begin August 1, 1941, and is asking physicians to *make immediate reports* to the State Board of Health of *all deaths of mothers connected with pregnancy.*

Briefly, the survey will consist, first, of field studies of the case history of all maternal deaths by an obstetrician sent out from the State Board of Health and secondly, analysis of the case studies by a Committee of Physicians. This Committee, as appointed by the Minnesota State Medical Association, is composed of Drs. R. J. Moe, of Duluth, Chairman, J. C. Litzenburg, A. Louis Dippol, and Viktor O. Wilson of Minneapolis, E. C. Hartley of St. Paul, R. D. Mussey of Rochester, Wm. H. Rumpf of St. Cloud, W. F. Mercil of Crookston, and B. O. Mork of Worthington.

This survey is prompted by recognition of the exceptionally low maternal death rate now prevailing in Minnesota. The State rate for 1940 of 2.2 deaths per 1,000 live births is the lowest ever recorded, and compares favorably with rates of highly specialized demonstration services.

The present rate is a 65 per cent reduction from that of 1920 when 6.2 mothers died for every 1,000 infants born alive. This reduction is a medical accomplishment of such high order that it may be aptly regarded as "reaching the goal" visioned twenty years ago by obstetricians and public health authorities. Minnesota can be justly proud of this record which deserves special study and place in the medical literature of the State.

On behalf of the Minnesota State Medical Association and the State Board of Health you are urged to immediately report maternal deaths to the State Board of Health by mail, or by phone if in the Twin Cities; and to give the field physician studying a death you may have reported your hearty coöperation in this laudible undertaking.

Respectfully,

A. J. Chesley, M.D.,

Secretary and Executive Officer.

July 30, 1941.

Health is the second blessing that we mortals are capable of—a blessing that money cannot buy.—Izaak Walton.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

DR. SINAI'S PROGRAM—1941

It is interesting to observe the changing tone manifested by popular articles on the subject of health insurance.

Only a few years ago, enthusiasm of the advocates ran at white heat, especially in the literary periodicals. Hopeful reformers fell upon the insurance principle for distribution of costs for medical service as upon a revelation. They admitted no dangers, saw no short-comings. Physicians were distressed and bewildered chiefly because of the ignorance of medicine and human nature which were so naively displayed.

The article called "But Health Insurance Is Different," by Dr. Nathan Sinai which appears in the current *Harpers* shows, however, that discussion of the question has progressed a great way toward a more mature and realistic understanding of the problems involved.

Drew Up Michigan's First Plan

Dr. Sinai has long been interested in the insurance method of payment for medical expense. It was he who, with Dr. Henry Luce of Michigan, evolved the first health insurance plan, forerunner of the present Michigan Medical Service, which was considered and shelved in 1934 by the Michigan State Medical Society. Dr. Sinai served before that on the Committee of Costs of Medical Care which reported in 1932 and, though he continues as professor of Hygiene and Public Health at the University of Michigan, he has, by his own confession, made medical economics his main interest in life.

Restricting Early Hopes

It is clear that Dr. Sinai and the early enthusiasts no longer expect health insurance to end all of the problems of the sick nor to translate the American doctor and patient promptly and painlessly into a fee-less medical Utopia. Careful studies by medical organizations, and latterly by actuarial experts, plus a considerable body of experience, have modified early enthusiasms and restricted early hopes. For that change of attitude physicians and the social planners, as well, owe a debt of gratitude to organized medicine which insisted vigorously upon looking before it leaped.

Like many other state medical organizations, the Minnesota State Medical Association is continuously studying the question and observing plans already in operation under medical sponsorship in many parts of the country. Unlike many of them, its Committee on Sickness Insurance has not yet proposed any insurance plan for Minnesota and may never do so. It will undoubtedly base its policy upon experience and results elsewhere, omitting costly trial and error experiments here.

Course More Cautious

Those who read the exhaustive actuarial study by Mr. Wendell Milliman, published recently in these columns, will applaud that course. They will be interested, too, in reading the Sinai article and in noting that Dr. Sinai's recommendations for 1941 have unmistakably been influenced by such studies. His assumption that "the battle for health insurance is over" seems a little premature; but he plots a far more cautious course, nevertheless, than his predecessors in the lists and displays a healthy recognition of some of the pitfalls involved.

As a first step in his program, Dr. Sinai suggests inclusion of hospitalization and physicians' services for surgical and obstetrical cases only. The importance of medical cases is granted, he says; but until there are better methods of control, the inclusion of this class of patients is a threat to solvency.

Home Care Second

As a second step—"after enough time has gone by to permit those who are running the plan to acquire administrative experience and to correct

defects of organization"—he feels that the health insurance should embody services to general practitioners in offices and homes.

Home and office care is emphasized, he says, for its preventive value in early diagnosis and treatment. To this he suggests adding a much more extensive use of the visiting nurse as an aid to the doctor, as a means of public education and to reduce hospitalization costs.

His medical insurance program would then cover the surgeon, the obstetrician, the general practitioner and the visiting nurse, together with the hospitals for surgical and maternity cases.

"Clean Cut Program"

"These," he says, "constitute a clean cut program for medical care that may be covered by health insurance with reasonable safety. More is necessary but much more needs to be known before all of the other special services outside and inside the hospital can be added."

Just how the necessary administrative controls are to be applied in his program is not even touched upon. Nor does he tackle the matter of premium charges to the subscriber, a rock upon which several programs are already beginning to flounder, since a premium sufficient for adequate medical service is proving more difficult than many planners had anticipated to sell.

No One Can Say

Dr. Sinai's conclusions are interesting, however.

"No such modest program will satisfy those who visualize sweeping changes in the present form of medical service as well as in the method of payment," he says. "No one can say what will be the pattern of practice twenty-five or fifty years hence. The present system may be wholly right, partially right, partially wrong or wholly wrong, but nevertheless, it exists. Rightly or wrongly the great majority of physicians are averse to becoming salaried employes and they insist that their compensation shall be in the form of fees for the services they render. As already stated, there is an important place for experimental plans, for laboratories where different methods of practice and of payment may be tried out and analyzed. Under laboratory conditions one may easily correct an error which might prove disastrous if it were made in a system with millions of subscribers and thousands of physicians.

Neither Angels Nor Fools

"Health insurance is in motion and behind it there is a dynamic power that has its source in the increasing public demand for relief from the economic hazard of sickness. There are those who, living in their little world of absolutes, regard the word 'change' as a synonym for 'calamity.' There are others who see in the demand the possibility of a quick and complete solution to all of our problems of health. But those who try to translate public demand into the minute details of organization, administration and costs for millions of people, approach the problem with the healthy apprehension it deserves. They are neither angels nor fools, they are realists; and the task is huge."

DISTRIBUTE THE DOCTORS

The problem of supplying physicians for civilian medical services in the defense emergency is resolving itself into a question of redistribution in Minnesota.

This conclusion is drawn by state medical association officials after careful study of civilian defense problems in the state.

The ratio of doctors to the population is larger here than in many other states and larger than the ratio regarded as necessary by most experts for adequate medical service to the civilian population.

The relatively small number thus far called to active military duty can be spared without seriously disturbing home medical services.

An Uphill Climb

The trouble, according to state authorities, is that too many young doctors, especially, have been settling in the large cities and too few have been willing to practice in the rural districts.

Many of these young men must struggle hard to gain a foothold in the larger centers; some of them never succeed in overcoming the keen competition and all are engaged in a long uphill climb before they can command a satisfactory urban practice. More of them could and should be persuaded to go out into the rural districts.

Some method of demonstrating the advantages of practice outside the urban centers is necessary for young doctors in Minnesota.

Rewards of Country Practice

With good roads and widely distributed modern hospitals all over the state, country practice carries with it few of the burdens and hardships that marked it for the country practitioner of a generation ago. By the same token it carries great rewards in security, pleasant community relationships and the knowledge that the doctor who undertakes it is filling a great and permanent need.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

PHYSICIANS LICENSED JULY 11, 1941

June Examination

Anderson, Richard Audrey, U. of Minn., M.B. 1940, M.D.1941, 2914 Newton Ave. N., Minneapolis, Minn.

Ausman, Duane Robert, U. of Minn., M.B. 1941, Sacred Heart Hospital, Spokane, Wash.

Bateman, James Gordon, U. of Minn., M.B. 1941, Alameda Co. Hospital, Oakland, Cal.

Bowers, Gordon Gill, U. of Minn., M.B. 1940, M.D. 1941, 444 Newton Ave. S., Minneapolis, Minn.

Brown, Frank Jerome, Marquette U., M.D. 1941, 235 W. Spring St., Chippewa Falls, Wis.

Bryan, Donald Irvin, U. of Minn., M.B. 1941, Wm. J. Seymour Hospital, Eloise, Mich.

Caldwell, Hayes W., Med. Col. of Va., M.D. 1938, Mayo Clinic, Rochester, Minn.

Carlson, Norman Carl, U. of Minn., M.B. 1941, Gillette Hospital, Saint Paul, Minn.

Clarke, Edward Treadwell, U. of Texas, M.D. 1939, Mayo Clinic, Rochester, Minn.

Conklin, Roscoe Edward, U. of Colo., M.D. 1935, Minneapolis Gen. Hospital, Minneapolis, Minn.

Conway, John Edward, U. of Wis., M.D. 1940, Ancker Hospital, Saint Paul, Minn.

Cundy, Donald Thomas, U. of Minn., M.B. 1941, Ancker Hospital, Saint Paul, Minn.

Dailey, Walter Charles, Rush Med. Col., M.D. 1939, East Grand Forks, Minn.

Demong, Charles Vincent, Syracuse U., M.D. 1938, Mayo Clinic, Rochester, Minn.

Drake, Emerson Hadley, Columbia U., M.D. 1941, St. Luke's Hospital, Morningside Heights, New York City, N. Y.

Egan, Sherman, Northwestern, M.B. 1939, M.D. 1940, Mayo Clinic, Rochester, Minn.

Evans, Charles Howard, Jr., McGill U., M.D. 1937, Mayo Clinic, Rochester, Minn.

Fox, William Richard, U. of Manitoba, M.D. 1941, Rugby, N. D.

Fulton, Alfred Miller, Jr., U. of Minn., M.B. 1940, Northwest Clinic, Minot, N. D.

Gates, Wright Addison, U. of Minn., M.B. 1940, M.D. 1941, 425 6th St. S.E., Minneapolis, Minn.

Grotting, John Kolben, U. of Minn., M.B. 1941, Detroit Receiving Hospital, Detroit, Mich.

Halper, Bernard, U. of Minn., M.B. 1941, Wayne Co. Hospital, Eloise, Mich.

Henslin, Merrill Edgar, U. of Minn., M.B. 1941, The California Hospital, Los Angeles, Cal.

Heyerman, Oscar T., Northwestern, M.B., 1940, M.D. 1941, Northwestern Hospital, Minneapolis, Minn.

Hogan, Clifford William, U. of Minn., M.B. 1939, M.D. 1940, Kensington, Minn.

Howe, Newell Willard, U. of Minn., M.B. 1941, Milwaukee Co. Hospital, Wauwatosa, Wis.

Ingalls, Edgar George, Jr., U. of Minn., M.B. 1941, Jersey City Medical Center, Jersey City, N. J.

Iverson, Herman Alexander, Johns Hopkins, M.D. 1941, Johns Hopkins Hospital, Baltimore, Md.

Johnson, Roger Harry, U. of Wis., M.D., 1939, Mayo Clinic, Rochester Minn.

Kaasa, Laurin Juul, U. of Minn., M.B. 1941, Ancker Hospital, Saint Paul, Minn.

Kendall, Rodney Frederick, U. of Minn., M.B. 1941, St. Mary's Hospital, Duluth, Minn.

King, John Robert, U. of Minn., M.B. 1941, Westfield, Mass.

Knight, Edwin Graham, U. of Minn., M.B. 1939, M.D. 1940, Randall, Minn.

Lampe, Margaret Ruth, U. of Minn., M.B. 1941, Tyler, Minn.

Lindeke, Harold Irving, U. of Minn., M.B. 1941, Medical Center, Jersey City, N. J.

Love, Robert Campbell, U. of Minn. M.B., 1939, M.D. 1940; Glenwood City, Wis.

McCaffrey, Fabian John, Jr., U. of Minn., M.B. 1940, M.D. 1941, 2749 Stevens Ave., Minneapolis, Minn.

McGroarty, Brian John, U. of Minn., M.B. 1940, M.D. 1940, Easton, Minn.

McNairy, Donald J., U. of Louisville, M.D. 1939, Mayo Clinic, Rochester, Minn.

Moehn, John Thomas, Creighton, M.D. 1941, Ancker Hospital, Saint Paul, Minn.

Moore, Orville Morris, U. of Neb., M.D. 1938, 225 W. 5th St., York, Neb.

Musgrove, James Edward, U. of Manitoba, M.D. 1939, Mayo Clinic, Rochester, Minn.

Nelson, Carleton Alexander, U. of Minn., M.B. 1941, Minneapolis Gen. Hospital, Minneapolis, Minn.

Olsen, Ralph Lormar, U. of Minn., M.B. 1941, 856 University Ave., Saint Paul, Minn.

Peterson, John William, U. of Minn., M.B. 1941, Kings Co. Hospital, Brooklyn, N. Y.

Pumala, Erven Enzio, U. of Minn., M.B. 1940, M.D. 1941, St. Barnabas Hospital, Minneapolis, Minn.

Ravits, Harold G., U. of Minn., M.B. 1941, Wayne Co. Hospital, Eloise, Mich.

Rosenow, John Henry, Harvard, M.D. 1938, Mayo Clinic, Rochester, Minn.

Sloan, Benjamin C., U. of Minn., M.B. 1941, General Hospital of Fresno County, Fresno, Cal.

Steiger, Elmer Edward, U. of Wis., M.D., 1940, Nopeming, Minn.

Strauss, Eugene Cecil, Hahnemann, Phila., M.D. 1940, Grand Marais, Minn.

Tenen, Max Marcus, U. of Minn., M.B. 1941, 2301 Oak Park Ave. N., Minneapolis, Minn.

Tudor, Richard Beresford, U. of Minn., M.B. 1941, Duke Hospital, Durham, N. Car.

Thill, Leonard Joseph, Marquette, M.D., 1941, Fennimore, Wis.

Vaudreuil, William Francis, U. of Wis., M.D. 1940, Miller Hospital, Duluth, Minn.

Watson, Richard Edward, U. of Minn., M.B. 1940, M.D. 1941, 1044 Lowry Med. Arts Bldg., Saint Paul, Minn.

Wentink, Elaine Anne, U. of Minn., M.B. 1941, Gallinger Hospital, Washington, D. C.

Zagaria, James Francis, U. of Minn., M.B. 1940, Santa Fe Hospital, Topeka, Kansas

By Reciprocity

Berg, Walter Richard, Marquette U., M.D. 1926, Gillet, Wis.

Lookanoff, Victor Alexander, Rush Med. Col., M.D. 1934, Middle River, San Hawthorne, Wis.

Spencer, Philip Lawrence, U. of Iowa, M.D. 1939, Mounds Park Hospital, St. Paul, Minn.

National Board Credentials

Brooks, Samuel McLeod, Harvard U., M.D. 1936, Mayo Clinic, Rochester, Minn.

Fawcett, Robert Magwood, U. of Pa., M.D. 1940, Starkweather, N. D.

Gullingsrud, Miles Joseph, Orlando, Harvard U., M.D. 1939, Thief River Falls, Minn.

Ould, Carlton Lee, Duke U., M.D. 1937, Duke Hospital, Durham, N. Car.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases

J. L. McLeod, Grand Rapids, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
G. L. Berdez, Duluth
T. G. Clement, Duluth
W. S. Lemon, Rochester
T. A. Lowe, South Saint Paul
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O. H. Wangensteen, Minneapolis
A. E. Wilcox, Minneapolis

THE FEET BENEATH THE MEN BEHIND THE WHEELS OF INDUSTRY

Foot disturbances may be classified briefly as congenital or acquired imperfections; diseases or traumatic conditions of bones, joints, muscles, nerves and skin; paralytic or circulatory impairments; and tumors.

Over a five-year period, approximately one-half of male industrial workers (ages from late second to early eighth decades) who are employed at standing or walking occupations will consult their first aid or medical service about foot complaints. The majority of these are seen two or more times and the complaints are caused by myotic infections, flat-feet, painful heels, ingrown toenails, painful calluses, corns, metatarsalgia, and common acquired deformities. Not many of the conditions are disabling, but they affect the worker's effort and disposition to a degree which noticeably alters his work output as well as quality. Doctors agree that few patients show as much facial expression of satisfaction as those who limp into the office with painful calluses, corns, and other minor foot complaints which are readily amenable to treatment.

Injuries

Foot injuries are more common off than on the job because only one-fourth of the workman's time is spent actually at work and many workmen wear protective steel-toed shoes while at work. Crushing injuries to the toes and metatarsal region from falling objects impinging the feet against the floor are the most frequent cause of foot disability resulting from injury. Concerted effort of the plant safety unit with instruction to the men on availability of steel-toed shoes at no greater cost than regular shoes and safe methods of handling such material as might cause hazard can eliminate those dangers. Sharp objects such as nails projecting from boards on floors frequently penetrate thin-soled shoes and carry dirt, particles of leather or shreds of dirty socks into any of the plantar, intermetatarsal or dorsal fascial spaces, may cause tendon, nerve and bone injuries or give rise to staphylococcus, streptococcus, gas bacillus, or tetanus infections. Surgical consideration of foot and ankle injuries and deformities is well covered by Callander[1] and by Lewin.[2]

Proper Shoes

Proper shoes and foot hygiene are essential foot insurance. A shoe should be made on a straight last and should have a round toe and a heel of moderate height. It should be narrow in the heel and through the waist of the foot, but wide through the ball. The shank must not be too wide or too narrow. The rigidity and flexibility varies with the person and his defects. The contours should not cause irritation. Little difficulty is experienced in obtaining properly shaped shoes for children and men, but girls and women are the victims of style, vanity, and the shoe salesman. They prefer to fit the eye rather than the foot.[2] Corrective modifications may be made to suit individual needs by use of the Thomas or reversed. Thomas heel, elevation of outer border of sole, use of metatarsal bar or crescent, Hauser metatarsal comma bar, or Lewin tilted, notched, rubber metatarsal crescent, all of which require a flexible shank to produce the correct relation of sole to heel. Painful heels may be relieved of pressure areas by splitting or cutting out necessary sections. The internal modifications of shoes include inserts, steel bars, rigid uppers, the removal of toe caps, the removal of counters, use of patch pockets, and pressure pads. Felt pads of numerous designs may be used to support and to relieve pressure.

Foot Hygiene

Foot hygiene includes frequent bathing, wearing of shoes and hosiery which allow sufficient ventilation of feet, trimming of toenails straight across, treatment of skin diseases and nail deformities, and avoidance of constriction by shoes, garters, or hosiery.[2]

References

1. Callander, C. Latimer: Surgical Anatomy. pp. 777-813. Philadelphia: W. B. Saunders Co., 1939.
2. Lewin, P.: The Foot and Ankle. Philadelphia: Lea and Febiger, 1940.

Meeting of May 4, 1941

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, May 14, 1941. Dinner was served at 7 o'clock and the meeting was called to order at 8 o'clock by the president, Dr. John M. Armstrong.

There were fifty-two members and one guest present.

Minutes of the April meeting were read and approved as read.

There was no business to come before the society, so the scientific program followed.

Dr. W. A. Hanson read the following paper. Lantern slides were shown.

RELAPSING FEBRILE NODULAR NONSUPPURATIVE PANNICULITIS

W. A. Hanson, M.D., and
L. H. Fowler, M.D. (by invitation)
Minneapolis

Since the original description of this disease by Victor Pfiefer[11] in 1892 only three cases occurring in males and seventeen in females have been recorded in the literature. In 1916 in this country Gilchrist[8] and Ketron published their findings in a similar case, followed by Weber[17] in 1925 who gave an excellent description of the disease. H. A. Christian[6] in 1928 observed the fourth case and added the term febrile. He also ventured the opinion that it should be called a syndrome rather than a disease.[6] Additions to the literature have been made by Alderson and Way,[1] Nethertone,[9] Binkley,[4] Brill,[5] Reed,[12] Anderson,[12] Cummings[7] and Lever,[7] Schaffer[14] and Weber,[18] while the last two cases were reported by I. L. Tilden, Gotshalk and Avokin[16] in 1940.

The disease is characterized by recurring attacks of malaise, usually fever of varying degrees and usually with relapses.[4] There is an inflammation of the panniculus adiposus with nodular distribution, generally with pain but without suppuration.[17] The patient is usually seriously ill.[5]

The nodules are either plainly visible or if not are easily felt on deep palpation. They may show various degrees of erythema, a mottled brawny pigmentation with tenderness on palpation and may undergo spontaneous regression.[4] As a result of this process there is localized atrophy, sharply circumscribed depressions in the contour of the skin[6] and a marked scarring appearance.

In the acute stages of the disease there is reddening of the epidermis with no other changes to be observed. On completion of the process the skin manifests a normal appearance.

As a rule, no pathologic changes are found in other parts of the body, although in Brill's case there was an enlarged spleen.[12]

The etiology of the disease is unknown,[13] although in the earlier reports iodides and bromides were mentioned as etiological factors.[17] These were not observed in the later cases reported.[16] One may argue that the cause is infection or toxins, which would be difficult to explain inasmuch as the skin, fascia and muscles are not involved in the process.[6] Probably a filterable virus may be a factor in the production of the disease or syndrome.[3]

Most of the patients were inclined towards obesity.[4] The age incidence was from eight to sixty-four years.[1,19] The blood showed a relative lymphocytosis, leukopenia and negative cultures.[7] The blood cholesterin and total lipase content were within normal limits.[4]

The nodules, excised tissue and aspirated material have shown no organisms on cultures or smears.[4] There has been no indication of any disturbances of the fat metabolism.

The diagnosis is usually not difficult especially in the second and third stages of the disease. One might confuse it with erythema nodosum, erythema induration or subcutaneous sacroid of Darier and Roussy,[7] but in none of these diseases is there atrophy of the subcutaneous fat without changes in the skin.[7] Adiposus dolorosa, nodular syphilis and migratory phlebitis may resemble the disease. According to Binkley,[4] who observed the disease first in both breasts and later elsewhere in the body, it might be confused with multiple fibro-adenoma, and the isolated nodules may show skin attachments analogous to carcinoma of the breast. In any case, biopsy will prove the diagnosis.

Pathologic Picture.—Most observers report that the epidermis shows very little change, while a few have described a slight increase in the vascularity with a perivascular exudate. Gilchrist and Ketron[8] expressed the opinion that in this disease an unknown cause leads to a change in the subcutaneous fat; the metamorphosed fat acts then as a foreign body and calls forth a foreign body inflammatory reaction.[7]

The subcutaneous fat shows an infiltration by dense perpendicular strands of connective tissue.[8] This is also observed between and in the fat cells. Cumens and Lever believe the macrophages composed the greater proportion of the infiltrating cells with an occasional monocyte present.[7]

These macrophages are large cells with foamy cytoplasm filled with small vacuoles. Their nuclei may have one or more nuceoli. These macrophages have also been observed in the spaces between the fat cells and by confluence form giant cells with ten or more nuclei in some areas. They may be within the capsule and replace the fat cells. A peculiar areolar collagenous[7] tissue was also observed where the fat had disappeared, and associated with this were lymphocytes, plasma cells, monocytes, fibroblasts and a few polymorphonuclear cells. Areas of necrosis were also present. The vessels[10] in the subcutaneous and connective tissue and among the fat cells generally appeared more

numerous. The vessels were dilated and thickened by perivascular fibrosis, edema, infiltration of the lymphoid cells and macrophages. The walls of the vessels were also separated. Thus the procedure of events is as follows: the fat cells are invaded and digested by



Fig. 1. Photograph of the right and left extremities. There is a relative increase in size of the right knee joint area due to slight flexure. At *A* is seen a slight depression at the site of the original lesion. At *B* note the depression due to the loss of the subcutaneous tissue.

the macrophages, and after the digestion of the fat cells become necrotic, followed by invasion of the lymphocytes, monocytes and fibroblast cells.[10] The inflammatory tissue gradually loses its many nuclei and becomes fibrotic and contracture ensues, so that in the first two stages we have a palpable nodule, while in the third stage the depression of the skin develops.[10]

Prognosis.—From the previously reported cases relapses are the rule.[1,18] Some writers have recorded patients with ten or more recurring attacks of the disease, extending over a period of several years.[6] Relatively few patients die of the disease.

Treatment.—Most authorities advocate evacuation by aspiration or drainage of the affected areas, high vitamin intake and iron. There is no specific therapy for the disease.

Report of Case

January 28, 1940, H. W. H., a male, white, twenty-eight years of age, single, by occupation a purchasing agent, presented himself with the following complaint. For several weeks he had noted a dull intermittent pain and localized tenderness above the inner aspect of the right knee. This did not disable him from his usual occupation.

His family history was irrelevant.

Previous Diseases and Operations.—He had had diphtheria, mumps and chickenpox as a child without complications; tonsillectomy at the age of eight years and a fracture of the right wrist at the age of sixteen years. He stated he had injured his knees by "over-lifting" in 1926 from which he made a good recovery.

In 1933 he had had a urological investigation which revealed a nonspecific seminal vesiculitis from which he later completely recovered.

Appendectomy had been performed in 1937 for a recurrent appendicitis in a retrocecal appendix.

Clinical History.—He informed us that during the past several weeks he had had dull, intermittent pain associated with tenderness over the inner aspect of the right lower thigh. Recently they had become more severe and pronounced. There had been no fever. He also complained of malaise and intervals of unexplained dizziness. No history of recent accident, trauma or injury to the extremity could be obtained. His history by systems otherwise was essentially negative.

Physical Findings.—This well developed man was five feet eleven inches in height and 182 pounds in weight. His blood pressure registered 122 systolic and 70 diastolic in mm. of mercury. His pulse was 72 per minute, and his temperature registered 98.6° F. Eyes and ears were normal on examination and the tonsils had been well removed. There were no masses found in the neck. The heart and chest were normal. The abdomen revealed a well healed right lower rectus scar, but no masses or tenderness on palpation. There were no hernias. The genitalia were negative, and on rectal examination the prostate and seminal vesicles were normal.

The right knee showed the motions to be within normal limits, and on palpation a slight tenderness was noted over the inner lower surface of the thigh.

Laboratory Findings.—Examination of the urine was negative. The blood revealed the hemoglobin 89 per cent, and the red and white counts were within normal. His blood Wassermann was negative. The intradermal tuberculin test showed no response. X-rays of the chest and the right lower extremity showed no evidence of disease.

Treatment and Subsequent Course.—He was treated conservatively for a period of two months with moist hot packs and a heat lamp. On March 21, 1940, he stated his thigh was more tender and there was an extension of the process at a higher level over the medial surface of the thigh. Examination of the extremity showed the process had extended to the upper inner half of the thigh, and there was a rather firm sensation on palpation of the affected areas. He had no fever.

He was referred to Dr. S. E. Sweitzer for consultation and he gave the patient a series of x-ray treatments, diet and high vitamin medication. However, there was no improvement.

On May 10, 1940, he was seen again. At this time he was acutely ill. His temprature was 100.8° F., and his pulse was 96 per minute. He complained of extreme weakness, dizziness and more tenderness just above the knee joint area. On examination the knee joint area was somewhat enlarged, and there was also slight swelling of the inner surface of the right thigh just above the knee and an enlarged inguinal lymph node. He was hospitalized and treated conservatively by elevation of the extremity and continuous hot moist packs. A few days later under novacaine anesthesia an attempt was made to aspirate the area, but no fluid was obtained. A posterior leg splint was applied and the previous treatment again was carried out. After a ten-day interval, he was discharged from the hospital.

On June 30, 1940, he reentered the hospital for observation and exploration of the area affected. The area now was thought to be semi-fluctuant, was pig-

mented and had extended further anteriorly, superiorly and posteriorly over the lower thigh. Under gas anesthesia the site was explored. The subcutaneous tissue appeared rather firm and of waxy consistency. No fluid was encountered. The underlying fascia and structures appeared normal. Cultures were obtained from the area and also a section of the adipose tissue for culture and biopsy. The wound was closed without drainage and dry dressings applied. A report on the cultures and smears showed no organisms. The excised tissue on microscopic section showed inflammatory tissue with moderate connective tissue present with many lymphocytes, plasma cells, macrophages and a few giant cells.



Fig. 2. *(Above)* View of inner aspect of the right lower thigh. Arrow shows the area of biopsy and depression in the contour of the skin at the site of the original lesion.



Fig. 3. *(Below)* Right knee joint area. Areas of ulceration following spontaneous eruption of third area of relapse.

On July 12, 1940, the wound began to drain rather marked amounts of brownish oily fluid, which on repeated smears and cultures revealed no organisms present. He was discharged from the hospital after ten days. Inasmuch as the previous investigations were essentially negative and we had observed this oily exudate, our attention was directed toward the diseases of the panniculus adiposus. Several similar cases had previously been reported. The area was completely healed by October, 1940, with a small area of depression in the contour of the skin. His condition and complaints were about the same until November 16, 1940, when he had the second relapse over the outer upper area of the right thigh, accompanied by a fever of 102° F. At this time the area was reddish and raised. A few days later the area was aspirated under local anesthesia obtaining 300 c.c. of brownish gray rather thick fluid, which on culture again showed no organisms. This area drained several days and was finally well healed in three weeks with a large area of depression present.

On January 8, 1941, he had the third relapse involving the right calf of the leg and the outer and under surface of the knee. These had the same characteristic appearances as the previous lesions but spontaneously ruptured with a discharge of brownish oily exudate, which was again negative on bacteriological investigation. The ulcerated areas measured 1x2, 1.5x2, and 3x4 cm. in diameter with large areas of the skin undermined and overhanging. The blood cholesterol at this time was 166.6 mg. per 100 c.c., and the serum lipase .4 c.c. n/20 sodium hydroxide per c.c. serum, the latter being considered normal; the blood sugar was 87.5 mg. per 100 c.c. The treatment was the same as previously carried out. However, we believed large soft compression sponges over the dressings, reinforced by elastic bandages, would hasten the healing of the areas, which later proved the case. By April 26, 1941, the areas were completely healed, with large areas of depression in the contours of the skin over the upper, outer and lower medial aspects of the thigh, likewise over the calf of the right leg and posterior knee joint spaces, which on examination show a marked loss of the subcutaneous tissue. The brawny pigmentation is disappearing, and he is generally much improved without any complaints at the present time.

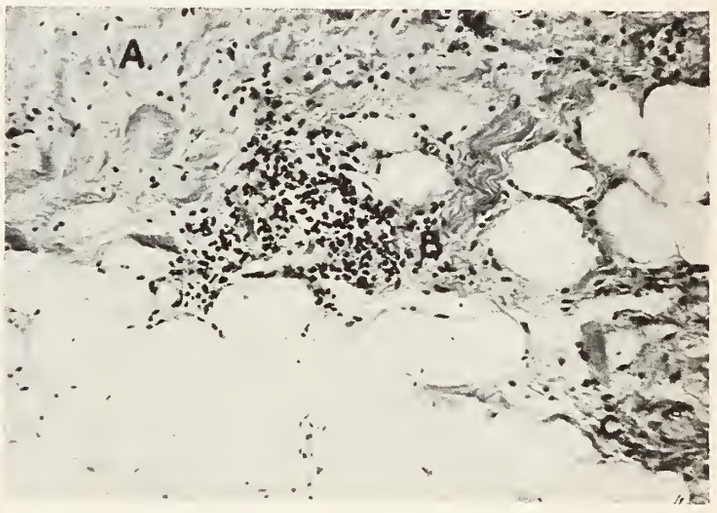


Fig. 4. High power x4 magnification. Section from biopsy in Figure 3. At *A* note the dense fibrous connective tissue below the epidermis; at *B* area of infiltration of lymphocytes and plasma cells. These areas have replaced the normal subcutaneous fat. *C* areas of normal subcutaneous fat.

Comment—We wish to report the fourth case of relapsing febrile nodular nonsuppurative panniculitis occurring in the male and twenty-first in the combined series, the characteristic clinical and pathological findings being similar to the previously reported cases.

One is impressed with the very limited investigative work previously carried out on panniculus adiposus; likewise that the structure possesses definite physiological functions and properties and that it can also have certain pathological variations.[19]

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Discussion

Dr. S. E. Sweitzer, Minneapolis: Panniculitis is a rare condition and is often seen first by the dermatologist. Dr. Hanson's patient was seen by me and was given filtered -xray, without much benefit. We know nothing of the cause of this disease and little about the treatment. The cases should be reported as seen and in time something may be found out about them. Dr. Hanson has done some very good work in this case even if his investigations were negative.

TERMINAL ILEITIS WITH PERFORATION

Report of Case

H. B. Zimmermann, M.D.
Saint Paul

The patient was a boy fifteen years old, admitted to the hospital on April 12, 1941.

The history began just about a year ago when he was admitted to the hospital for the first time on May 21, 1940. At that time he had an acute abdomen, diffusely painful, exquisitely tender, with the point of maximum tenderness in the right lower quadrant of the abdomen, where was also the area of maximum rigidity. His temperature was 102°, leukocyte count 9,200, other blood findings normal. He kept high right leg flexed, abdomen quiet and fixed.

His previous history was that for years he would have moderately severe abdominal cramps, with some looseness of the bowels. The attacks were never incapacitating, never kept him home from school.

Three days before his first admission he had rather violent colicky pains; the day before admission he had a severe attack of pain, with all the signs of peritoneal irritation.

I made a diagnosis of acute appendicitis with perforation. At operation there was free pus in the abdomen, the peritoneum was severely inflamed, and the appendix was quite normal. On the anterior surface of the ileum, about three inches from the cecum, there was a perforation to which was adherent a tag of omentum.

The perforation was closed with a suture, the omentum fastened to it, and the wound closed. After a stormy convalescence, he recovered. At the end of three months he went back to school for a short time, when he again began to have trouble—severe attacks of abdominal pain and diarrhea, and gradual loss of weight.

The family refused operation until April 12, 1941. By this time the boy was emaciated, more or less dehydrated, and cyanotic; and was vomiting from what seemed to be a complete ileus. He was given intravenous solutions of sugar, some blood plasma, and his gastrointestinal tract was decompressed by Wangensteen's suction. He improved very much, but still had several fistulæ through the old scar.

At the end of fifteen days he was again operated upon, the abdomen was opened through a long right rectus incision. After separating a mass of adherent omentum and viscera, the lower ten inches of the ileum was found thickened and contracted so there was practically no lumen; the mesentery was shrunken so that it was only about 1.5 inches deep and contained large inflammatory nodes, one of which had broken down, and there was a fistula extending from it to the transverse colon. The entire mass, including about 11 inches of ileum, the descending colon, and about 9 inches of the transverse colon, was resected and a lateral anastomosis was made between the good ileum and the transverse colon.

The patient made a very good recovery and was discharged from the hospital two and a half weeks from the day of operation.

The histological sections of the bowel show a marked dilatation of all the lymph vessels and lymph spaces, especially in the sub-mucosa and the muscularis.

This case illustrated very well the thesis of Reichert and Mathes, who, in 1936, produced this condition experimentally by destroying the lymphatic drainage of the small bowel by injecting sclerosing solutions into the lymph vessels of the mesentery, producing by this means an elephantiasis of the bowel.

(Slides were shown)

Discussion

Dr. Robert Earl, Saint Paul: About two and a half years ago I operated upon a woman who had had three previous laparotomies for right lower quadrant symptoms.

When I first saw her, she had a mass in the right lower quadrant with almost complete obstruction. There was tenderness and some swelling above the crest of the right ileum.

At operation about 10 inches of the distal ileum, the cecum, and proximal half of the ascending colon were inflamed. The mesentery was edematous and the lymph nodes were enlarged. On separating the cecum and the ascending colon from the right abdominal wall, a post-cecal abscess was encountered which had developed from a perforation in the cecum and involved the abdominal muscles attached to the ileum. The distal 16 inches of ileum, cecum, and the ascending and hepatic flexure of the colon were brought out through the right rectus incision, clamped, excised, and treated as Mickulicz operation on the sigmoid.

The patient made a nice recovery and has remained well except that fifteen months ago she developed an obstruction of the ileum in the left upper quadrant from undetermined cause. This obstruction was relieved by a longitudinal incision of the ileum which was closed transversely, with uneventful recovery.

Dr. A. A. Zierold, Minneapolis: It seems to me that in all of the comment made on enteritis, one fact has been neglected, viz., that it is rarely reported in autopsy findings. As the condition is by no means a rare find-

ing at operation, it would appear logical to believe that many cases must occur and also recover without treatment. On such assumption. I would suggest that in the absence of obstruction, abscess, or fistula, acute enteritis does not demand surgical treatment. In five instances I have demonstrated the uncomplicated condition at operation, and have refrained from resection or enterostomy and, in each, recovery occurred. Subsequent x-ray examination revealed no demonstrable change in intestinal lumen or motility.

Dr. Zimmermann, in closing: I am inclined to think that Dr. Zierold is right—some patients with regional ileitis do get well. I am now watching two patients who seem to be improving. I am quite certain, however, that this child would have died had not the involved intestine been removed and an anastomosis made.

PARADUODENAL HERNIA
Report of Case

E. Mendelssohn Jones, M.D.
Saint Paul

The duodenal fossa was first described by Hensing in 1742. Bordenave in 1779 and Neubauer in 1786 reported cases of duodenal hernia but in 1857 Treitz published the classical description of the anatomy of this hernia establishing the importance of internal hernia into the peritoneal fossa. In 1937 Longacre reviewed the literature and found 140 cases. Moynihan described nine fossæ in which internal hernias may be found.

The superior duodenal fossa is the upper part of the duodenojejunal fossa originally described by Treitz and is present in 40 to 50 per cent of all subjects. It may exist alone although it is usually associated with an inferior duodenal fossa. The superior duodenal fossa lies to the left of the ascending duodenum opposite the level of the second lumbar vertebra. This fossa is bounded above by the superior duodenal fold which presents a semilunar ring that merges on the right into the peritoneum that covers the ascending duodenum and on the left with the peritoneum in front of the left kidney. The inferior mesenteric vein nearly always corresponds to the ponit of junction between the superior duodenal fold and the parietal peritoneum. Treitz also described the inferior duodenal fossa and it is the most constant of the duodenal fossa, being present in 70 to 75 per cent of all subjects. It is situated on the left side of the ascending duodenum opposite the third lumbar vertebra. When the superior and inferior duodenal fossa coexist they share a single orifice which is generally oval in shape. Occasionally there is an extension of the fossa behind the ascending duodenum and this presents a large fossa that is particularly liable to become the site of a hernia.

In the case to be presented, the hernia occurred in the mesentericoparietal fossa. This fossa was described in 1874 by Waldeyer. He pointed out that the formation of this fossa was due to the raising up of a peritoneal fold by the superior mesenteric artery. This fossa is rarely found excepting in the fetus and the newly born. It is usually situated behind the superior mesenteric artery just below the duodenum. Waldeyer felt that it was possible that this variety of fossa accounted for some of the reported cases of hernia into the mesentery or through rents in the mesentery.

Report of Case

A twenty-year-old male who was first seen at the Ancker Hospital on September 9, 1940, complained of having epigastric pains and vomiting which were not related to meals but were relieved somewhat by catharsis. Dizzy spells with faintness and some memory loss were associated with muscular effort and physical strain. There was no unconsciousnes or epilepiform symptoms. Examination was essentially negative except for moderate tenderness over the epigastrium and the upper right quadrant of the abdomen. An x-ray study of the gall bladder showed normal response and no evidence of biliary calculi. X-ray examination of the gastro-intestinal tract showed the stomach and duodenum to be negative but the small bowel study was reported as suggestive of a paraduodenal hernia. A second x-ray study confirmed the findings of the first examination and a diagnosis was made of a right-sided paraduodenal hernia. Because the symptoms were increasing and the attacks of epigastric distress were so frequent that he could not carry on his work, he was admitted to the surgical service and he was operated upon January 30, 1941. At the operation the duodenojejunal area was exposed and a large part of the small intestine was found to have passed through an opening beneath the superior mesenteric artery and into the mesentericoparietal fossa. The opening into the fossa was large and, as there were no adhesions between the coils of intestines and the wall of the sac, the hernia was readily reduced. It was felt that a more satisfactory repair could be made if the sac was removed and because of the large opening, removal of the sac seemed feasible. This was accomplished without difficulty. The peritoneal edges were then sutured, care being taken not to injure the superior mesenteric artery. The postoperative course was uneventful and the patient states that the symptoms of which he complained have disappeared and he has returned to work.

The symptoms of nonstrangulated duodenal hernia are very indefinite and are usually limited to slight digestive disturbances. It has been stated that very few are diagnosed except at operation that is performed for symptoms thought to be those of intestinal obstruction and the hernia is found when search is made for the point of obstructions. Undoubtedly by careful x-ray examination and the gastro-intestinal tract more of these hernias will be detected preoperatively and surely the important feature of this case was the pre-operative x-ray diagnosis of a paraduodenal hernia.

Discussion

Dr. A. Colvin, Saint Paul: Dr. Jones has covered the ground very thoroughly. I would like only to emphasize that so far as we were concerned the diagnosis was made by x-ray. I don't believe I would feel like making a diagnosis of this condition unless I had x-ray pictures. When we first saw this boy it was quite doubtful as to what was the matter with him. We wanted to observe him for some time. So far as symptoms were concerned there was a rather mild character to his pains, compared with the severe nausea and very little vomiting extending over a long period of time.

Dr. Arnold Schwyzer, Saint Paul: This kind of hernia is rare. I want to report an unusual case of a left-sided paraduodenal hernia.

(Continued on Page 801)

International Medical Assembly

Inter-State Postgraduate Medical Association of North America

October 13-17, 1941

Pre-assembly Clinics, Saturday, October 11
Post-assembly Clinics, Saturday, October 18
Minneapolis Hospitals
MINNEAPOLIS, MINNESOTA

Monday, October 13

8:00 A.M.

Diagnostic Clinic: "Modern Treatment of Syphilis."
Dr. Paul A. O'Leary, Professor of Dermatology and Syphilology, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Diagnostic Clinic: "The Management of Intra-thoracic Tumors."
Dr. John Alexander, Professor of Surgery, University of Michigan School of Medicine, Ann Arbor, Michigan.

Diagnostic Clinic: "Pancreatic Hepatic Syndrome."
Dr. Warren H. Cole, Professor of Surgery, University of Illinois School of Medicine, Chicago, Illinois.

Diagnostic Clinic: "Goiter."
Dr. Robert S. Dinsmore, Cleveland Clinic, Cleveland, Ohio.

Diagnostic Clinic: "Undulant Fever."
Dr. Chester S. Keefer, Wade Professor of Medicine, Boston University School of Medicine, Boston, Massachusetts.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Maintenance of Nutrition in Surgical Patients."
Dr. Isidor S. Ravdin, George Leib Harrison Professor of Surgery, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

Diagnostic Clinic: "Medical Treatment of Gallstones and Cholecystitis."
Dr. John H. Musser, Professor of Medicine, Tulane University School of Medicine, New Orleans, Louisiana.

Address: "Coronary Artery Disease."
Dr. A. Carlton Ernstene, Head of the Cardiorespiratory Department, Cleveland Clinic, Cleveland, Ohio.

Address: "Cruciate Ligaments of the Knee Joint; Etiology, Pathology, Symptoms, Repair."
Dr. William R. Cubbins, Clinical Professor of Bone and Joint Surgery, Loyola University School of Medicine, Chicago, Illinois.

Address: "Migraine."
Dr. Carl D. Camp, Professor of Neurology and Chairman of the Department, University of Michigan School of Medicine, Ann Arbor, Michigan.

Address: "Uterine Bleeding."
Dr. Emil Novak, Associate Professor of Obstetrics, University of Maryland School of Medicine, Baltimore, Maryland.

Address: "Recent Advances in Our Knowledge of Tetanus."
Dr. Warfield M. Firor, Associate Professor of Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland.

Address: "Pitfalls in X-ray Diagnosis."
Dr. Harold D. Kerr, Professor of Radiology, State University of Iowa School of Medicine, Iowa City, Iowa.

Dinner Intermission

7:00 P.M.

Address: "High Concentration of Oxygen in Surgery."
Dr. Charles W. Mayo, Assistant Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Address: "Possibilities of Attainment in the Conservation of Hearing."
Dr. Horace Newhart, Professor of Otology, Rhinology and Laryngology, University of Minnesota School of Medicine, Minneapolis, Minnesota.

Address: "Anesthesia and Surgery."
Dr. Erwin R. Schmidt, Professor of Surgery, University of Wisconsin School of Medicine, Madison, Wisconsin.

Address: "Psychoses of Different Age Levels."
Dr. Louis J. Karnosh, Associate Clinical Professor of Nervous Diseases, Western Reserve University School of Medicine, Cleveland, Ohio.

Address: "Virus Diseases."
Dr. Robert G. Green, Professor of Bacteriology, University of Minnesota Medical School, Minneapolis, Minnesota.

Address: "Hypertension and the Surgical Kidney."
Dr. William F. Braasch, Professor of Urology, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Tuesday, October 14

8:00 A. M.

Diagnostic Clinic: "Stones in the Upper Urinary Tract."
Dr. C. Donald Creevy, Assistant Dean and Associate Professor of Surgery and Urology, University of Minnesota School of Medicine, Minneapolis, Minnesota.

Diagnostic Clinic: "Diseases of the Lungs in the Aged."
Dr. James G. Carr, Professor of Medicine, Northwestern University School of Medicine, Chicago, Illinois.

Diagnostic Clinic: "Carcinoma of the Stomach."
Dr. George P. Muller, Professor of Surgery, Jefferson Medical College, Philadelphia, Pa.

Diagnostic Clinic: "Neuritides."
Dr. John C. McKinley, Professor of Medicine and Nervous and Mental Diseases, University of Minnesota Medical School, Minneapolis, Minn.

Diagnostic Clinic: "Endocrine Problems in the Male."
Dr. Willard O. Thompson, Clinical Professor of Medicine, Rush Medical College of the University of Chicago, Chicago, Illinois.

Noon Intermission

(Continued on Page 786)

How to Use S-M-A Powder

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2 Add enough warm previously boiled water to make one ounce.

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ACCEPTED AMERICAN MEDICAL ASSN.

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(Continued from Page 784)

1:00 P. M.

Diagnostic Clinic: "Management of Cardiac Patients Who Require Surgery."
Dr. Herrman L. Blumgart, Associate Professor of Medicine, Harvard Medical School, Boston, Massachusetts.
Diagnostic Clinic: "Management of Complicated Fractures of the Extremities."
Dr. Clay Ray Murray, Associate Professor of Surgery, Columbia University College of Physicians and Surgeons, New York, New York.
Address: "The Prevention and Medical Treatment of Preëclamptic and Eclamptic Toxemia of Pregnancy."
Dr. Soma Weiss, Hersey Professor of the Theory and Practice of Physic, Harvard Medical School, Boston, Massachusetts.
Address: "The Rôle of the General Practitioner in the Prevention of Blindness."
(The Schneider Foundation Eye Presentation)
Dr. Harry S. Gradle, Professor of Ophthalmology (Extra Mural), Northwestern University School of Medicine, Chicago, Illinois.
Address: "Purpura."
Dr. Ernest H. Falconer, Clinical Professor of Medicine, University of California School of Medicine, San Francisco, California.
Address: "Cause and Treatment of Circulatory Failure in Surgery."
Dr. Dallas B. Phemister, Professor of Surgery, University of Chicago, The School of Medicine, Chicago, Illinois.
Address: "The Treatment of Injuries to the Peripheral Arteries with Particular Reference to Arteriovenous Fistula."
Dr. Emile F. Holman, Professor of Surgery, Stanford University School of Medicine, San Francisco, California.
Address: "The Diagnosis and Surgical Management of Brain Tumors."
Dr. Alfred W. Adson, Professor of Neurosurgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.

Dinner Intermission

7:00 P. M.

Address: "Diagnosis and Treatment of Wounds of the Heart."
Dr. Daniel C. Elkin, Joseph B. Whitehead Professor of Surgery, Emory University School of Medicine, Atlanta, Georgia.
Address: "The Parathyroids and Diseases of the Bones."
Dr. Thomas P. Sprunt, Professor of Clinical Medicine, University of Maryland School of Medicine; Visiting Physician, Johns Hopkins Hospital, Baltimore, Maryland.
Address: "Prostatic Obstruction."
Dr. William E. Lower, Cleveland Clinic, Cleveland, Ohio.
Address: "Nonoperative Treatment of Acute and Chronic Sinus Disease."
Dr. George E. Shambaugh, Jr., Associate Clinical Professor of Laryngology and Otology, Rush Medical College, Chicago, Illinois.
Address: "The Use of Pedicle Muscle Crafts in Obliterating Non-tuberculous Empyema Cavities."
Dr. Howard K. Gray, Assistant Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.
Address: "Disturbances of the Vascular System in Pregnancy."
Dr. John L. McKelvey, Professor of Obstetrics and Gynecology, University of Minnesota School of Medicine, Minneapolis, Minnesota.

Wednesday, October 15
8:00 A. M.

Diagnostic Clinic: "Regional Ileitis."
Dr. Claude F. Dixon, Associate Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.
Diagnostic Clinic: "Types of Clinical Nutritional Deficiency."
Dr. Virgil P. W. Sydenstricker, Professor of Medicine, University of Georgia School of Medicine, Augusta, Georgia.
Diagnostic Clinic: "Bleeding Peptic Ulcers."
Dr. Roscoe R. Graham, Assistant Professor of Surgery, University of Toronto Faculty of Medicine, Toronto, Canada.
Diagnostic Clinic: "The Itching Skin."
Dr. Oliver S. Ormsby, Clinical Professor of Dermatology, Rush Medical College, Chicago, Illinois.
Diagnostic Clinic: "Surgery of the Biliary Tract."
Dr. Frank H. Lahey, Lahey Clinic, Boston, Mass.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Differential Diagnosis and Treatment of Anemia."
Dr. Russell L. Haden, Cleveland Clinic, Cleveland, Ohio.
Pathological Clinical Conference:
Participants:
Dr. Henry M. Winans, Professor of Medicine, Baylor University College of Medicine, Dallas, Texas.
Dr. Virgil P. W. Sydenstricker, Professor of Medicine, University of Georgia School of Medicine, Augusta, Georgia.
Dr. E. T. Bell, Professor of Pathology, University of Minnesota Medical School, Minneapolis, Minn.
Dr. Owen Wangensteen, Professor of Surgery, University of Minnesota School of Medicine, Minneapolis, Minnesota
Dr. Leo G. Rigler, Professor of Radiology, University of Minnesota School of Medicine, Minneapolis, Minnesota.
Address: "Postoperative Pulmonary Complications."
Dr. Elliott C. Cutler, Moseley Professor of Surgery, Harvard Medical School, Boston, Mass.
Address: "Plastic Operations on the Lower Urinary Tract for Congenital Deformities."
Dr. Hugh H. Young, Professor of Urology, Johns Hopkins University School of Medicine, Baltimore, Maryland.
Address: "Significance of Convulsions."
Dr. Walter E. Dandy, Adjunct Professor of Neurological Surgery, Johns Hopkins University School of Medicine, Baltimore, Maryland.
Address: "Treatment of Gonadal Hypofunction in the Female."
Dr. Elmer L. Sevringhaus, Professor of Medicine, University of Wisconsin School of Medicine, Madison, Wisconsin.
Address: 'Some of the Advantages of Closed Anastomosis in Gastro-intestinal Resections."
Dr. Owen H. Wangensteen, Professor of Surgery, University of Minnesota School of Medicine, Minneapolis, Minnesota.

ASSEMBLY DINNER

7:00 P.M.—Informal

For members of the profession, their ladies and friends.

Dr. Roscoe R. Graham, President of the Inter-State Postgraduate Medical Association of North America—Master of Ceremonies.

(Continued on Page 788)

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FOR SALE BY SURGICAL DEALERS AND DRUGGISTS

(Continued from Page 786)

Thursday, October 16

8:00 A. M.

Diagnostic Clinic: "Burns and Reconstruction Surgery."
Dr. N. Logan Leven, Assistant Professor of Clinical Surgery, University of Minnesota School of Medicine, St. Paul, Minnesota.
Diagnostic Clinic: "Unexplained Fever."
Dr. J. Murray Kinsman, Associate Professor of Medicine, University of Louisville School of Medicine, Louisville, Kentucky.
Diagnostic Clinic: "Diverticulitis."
Dr. John F. Erdmann, Attending Surgeon, New York Postgraduate Medical School, New York, New York.
Diagnostic Clinic: "The Etiology and Treatment of Nephrosis in Children."
Dr. Irvine McQuarrie, Professor of Pediatrics, University of Minnesota School of Medicine, Minneapolis, Minnesota.
Diagnostic Clinic: "Cancer of the Colon."
Dr. Thomas E. Jones, Cleveland Clinic, Cleveland, Ohio.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Clinical Demonstration of Cases Illustrating the Common Types of Arthritis and the Present Status of Therapy."
Dr. Ralph Pemberton, Professor of Medicine, University of Pennsylvania Postgraduate School of Medicine, Philadelphia, Pennsylvania.
Diagnostic Clinic: "Automobile Injuries."
Dr. John J. Moorhead, Professor of Clinical Surgery, New York Postgraduate Medical School, New York, New York.
Address: "The Rise and Fall of Focal Infection."
Dr. Russell L. Cecil, Professor of Clinical Medicine, Cornell University Medical College, New York, New York.
Address: "Bronchiectasis."
Dr. Evarts A. Graham, Professor of Surgery, Washington University, School of Medicine, St. Louis, Missouri.
Address: "Pneumonia."
Dr. Hobart A. Reimann, Magee Professor of Practice of Medicine and Clinical Medicine, Jefferson Medical College, Philadelphia, Pennsylvania.
Address: "Osteomyelitis."
Dr. Frank R. Ober, Assistant Dean and John B. and Buckminster Brown Clinical Professor of Orthopedic Surgery, Harvard Medical School, Boston, Massachusetts.
Address: "Cesarean Section."
Dr. John R. Fraser, Professor of Obstetrics and Gynecology, McGill University Faculty of Medicine, Montreal, Canada.
Address: "Physiological Studies on the Usefulness of Helium in Respiratory Mixtures."
Dr. Maurice B. Visscher, Professor of Physiology, University of Minnesota Medical School, Minneapolis, Minnesota.

Dinner Intermission

7:00 P. M.

Address: "Peritonitis."
Dr. Frederick A. Coller, Professor of Surgery, University of Michigan School of Medicine, Ann Arbor, Michigan.
Address: "Heredity in the Clinic."
Dr. Lewellys F. Barker, Professor Emeritus of Medicine, Johns Hopkins University School of Medicine, Baltimore, Maryland.
Address: "Subcutaneous Injuries of the Abdomen."
Dr. Frederick Christopher, Associate Professor of Surgery, Northwestern University School of Medicine, Evanston, Illinois.
Address: "Renal Tuberculosis."
Dr. Herman L. Kretschmer, Clinical Professor of Surgery (Genito-Urinary), Rush Medical College, Chicago, Illinois.
Address: "Present Status of Surgery of the Heart."
Dr. Claude S. Beck, Associate Professor of Surgery, Western Reserve University School of Medicine, Cleveland, Ohio.
Address: "Pre-operative Preparation for Gastro-intestinal Surgery."
Dr. Verne C. Hunt, Clinical Professor of Surgery, University of Southern California School of Medicine, Los Angeles, California.
Address: "Clinical Use of Digitalis."
Dr. Peter T. Bohan, Professor of Medicine, University of Kansas School of Medicine, Kansas City, Missouri.

Friday, October 17

8:00 A. M.

Diagnostic Clinic: "Nervous Exhaustion as a Cause of Gastro-intestinal Symptoms."
Dr. Walter C. Alvarez, Professor of Medicine, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.
Diagnostic Clinic: "The Problem of Difficult Hernias."
Dr. W. Wayne Babcock, Professor of Surgery and Clinical Surgery, Temple University School of Medicine, Philadelphia, Pennsylvania.
Diagnostic Clinic: "Differential Diagnosis of Jaundice."
Dr. Wallace M. Yater, Professor of Medicine and Director of the Department, Georgetown, University School of Medicine, Washington, D. C.
Diagnostic Clinic: "Ulcerative Colitis."
Dr. Richard B. Cattell, Lahey Clinic, Boston, Massachusetts.
Diagnostic Clinic: "The Treatment of Diabetes of Long and Short Duration."
Dr. Elliott P. Joslin, Clinical Professor of Medicine, Harvard Medical School, Boston, Mass.

Noon Intermission

1:00 P. M.

Diagnostic Clinic: "Cancer of the Breast."
Dr. Frank E. Adair, Assistant Professor of Clinical Surgery, Cornell University Medical College, New York, New York.
Diagnostic Clinic: "Ascites."
Dr. Leroy H. Sloan, Professor of Medicine, University of Illinois College of Medicine, Chicago, Illinois.
Address: "Adrenal Tumors."
Dr. Waltman Walters, Professor of Surgery, University of Minnesota Graduate School of Medicine, Mayo Clinic, Rochester, Minnesota.
Address: "Prevention of Rickets with a Small, Single Parenteral Administration of Vitamin D_3."
Dr. Henry J. Gerstenberger, Professor of Pediatrics, Western Reserve University School of Medicine, Cleveland, Ohio.
Address: "Head Injuries."
Dr. Eric Oldberg, Professor of Neurology and Neurological Surgery, University of Illinois School of Medicine, Chicago, Illinois.
Address: "Acute and Chronic Glomerulonephritis."
Dr. E. T. Bell, Professor of Pathology, University of Minnesota Medical School, Minneapolis, Minn.

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Dr. W. A. O'Brien, professor of preventive medicine and public health at the University of Minnesota School of Medicine, addressed a meeting of the East Central Minnesota Medical Society in Cambridge, August 6. His subject was "Pasteurized Milk." Presiding was Dr. D. E. McBroom of Cambridge, society president.

NORTHERN MINNESOTA MEDICAL ASSOCIATION

Dr. Emmet Heiberg of Fergus Falls was elected president of the Northern Minnesota Medical Association at the annual meeting in St. Cloud last month. He succeeds Dr. J. F. Dubois of Sauk Center.

Other officers named are: Dr. R. N. Jones of St. Cloud, vice president; and Dr. Clarence Jacobson, Chisholm, secretary-treasurer.

Bemidji was selected as the 1942 convention city.

P. S. PELOUZE AWARD

The American Neisserian Medical Society announces an annual prize of one hundred dollars, to be known as the P. S. Pelouze Award, to be presented to the person under thirty-five years of age who, in the opinion of the Committee of Awards, has made the outstanding contribution to the control of the gonococcal infections during the preceding year.

Nominations for the award should be sent to the Secretary not later than March 31 of each year. The winner will be announced at the subsequent annual meeting of the Society. Nominations their year should be sent to Oscar F. Cox, M.D., 475 Commonwealth Ave., Boston, Massachusetts.

CASE HISTORY No. 102

CHEILITIS FROM LIPSTICK

Mrs. P. W. W.—. Symptoms: Lips fissured, scaling and dry. Advised all cosmetics be discontinued. After one week condition cleared. Patient asked foi and permitted use of lipstick. Eruption reappeared. Patch tests revealed bromo acid in lipstick used reacted positively. AR-EX non-permanent lipstick prescribed. After 3 years' use, with subsequent resumption of all other cosmetics, no cutaneous reactions recurred.

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SILVER PICRATE* *Wyeth*

A complete technique of treatment and literature will be sent upon request

*Silver Picrate is a definite crystalline compound of silver and picric acid. It is available in the form of crystals and soluble trituration for the preparation of solutions, suppositories, water-soluble jelly, and powder for vaginal insufflation.

Silver Picrate, Wyeth, has a convincing record of effectiveness as a local treatment for acute anterior urethritis caused by Neisseria gonorrheae.[1] An aqueous solution (0.5 percent) of silver picrate or water-soluble jelly (0.5 percent) are employed in the treatment.

1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., **23**, 201 (March), 1939.

JOHN WYETH & BROTHER, INCORPORATED, PHILADELPHIA

OF GENERAL INTEREST

Dr. Herbert Boysen has taken over the practice of Dr. Everett B. Coulter at Madelia.

* * *

Dr. R. E. Murray assisted Dr. Arthur J. Lewis of Henning, while the latter was on his vacation.

* * *

Dr. Ben Sommers has opened suburban offices at 2062 Ford Parkway, Highland Village, Saint Paul, for the practice of internal medicine.

* * *

Dr. A. E. Osterberg of Rochester attended a meeting of the Committee on Chemical Service to Medicine, American Chemical Society, in New York City, July 25.

* * *

Drs. J. W. Mader and G. F. Schmitt of Rochester, reserve officers in the United States Navy, have been assigned for service on the *U.S.S. Solace.*

* * *

Dr. Karl E. Johnson of Duluth has been called to active duty with the United States Navy, and has been assigned to the Marine base hospital at San Diego, California.

* * *

Dr. William C. Bernstein announces the opening of offices at 934 Lowry Medical Arts Building, Saint Paul. His practice will be limited to diseases of the rectum and colon.

* * *

Dr. Richard P. Virnig of New Richland has received an appointment as Acting Assistant Surgeon for intern training in the Medical Corps in the Navy, with rank of Lieutenant (junior grade).

* * *

When the Upper Des Moines Medical Society held its annual summer meeting at Templar Park and Spirit Lake, Iowa, July 10, speakers included Drs. John B. Erich, Walter C. Alvarez and William R. Lovelace of Rochester.

* * *

In coöperation with the Minnesota Society for the Prevention of Blindness, the American Medical Association set up an exhibit on the "Prevention of Eye Injuries" at the Minnesota State Fair in Saint Paul, August 24-30.

* * *

Dr. Johannes K. Moen of Minneapolis has been certified by the American Board of Internal Medicine, following the June examinations in Cleveland. Dr. Moen was recently promoted to the position of clinical assistant professor of medicine at the University of Minnesota Medical School.

* * *

Dr. A. Harold Mork has opened offices in the Anoka hospital in Anoka. A graduate of Creighton University medical school in Omaha, he served his internship at Mercy hospital in Council Bluffs, Iowa, and also spent a year at Ancker hospital in Saint Paul. He is the nephew of Dr. Frank E. Mork of Anoka.

Dr. Isabella C. Herb, formerly of the Mayo Clinic, recently retired from the staff of the Presbyterian Hospital in Chicago, and from the faculty of Rush Medical College after thirty-two years as head of the department of anesthetics at both institutions. She has been appointed anesthetist emeritus.

* * *

The Association of Fellows of the Mayo Foundation in Rochester staged a costume barn dance, August 2 at Mayowood, to provide funds to furnish a unit for the R.A.F. Hospital in England, headed by Dr. Archibald H. McIndoe, formerly a fellow in the Mayo Foundation.

* * *

When the American Congress of Physical Therapy and the American Occupational Therapy Association held their annual meetings in Washington, D. C., September 1-5, Dr. Henry L. Williams of Rochester addressed the physical therapy meeting on "Physical Treatment of Indurative Headache."

* * *

Dr. G. W. Clifford of Alexandria announces the formation of the Alexandria Clinic, which will include on its staff Dr. H. L. Stemsrud of Parkers Prairie and Dr. C. Nessa of St. Cloud. Dr. Clifford's offices have been remodeled and enlarged for the clinic, and new equipment has been installed

* * *

Dr. Lawrence Pearson, a native of Hallock, has become associated with Dr. Neil McLean Leitch of Warroad in the practice of medicine. He is a graduate of the University of Minnesota School of Medicine and has served internships at St. Barnabas Hospital in Minneapolis and the Charles T. Miller Hospital in Saint Paul.

* * *

Dr. Henry W. Meyerding of Rochester participated in a special institute on industrial health conducted in several cities of Iowa in June, under the sponsorship of the Iowa State Department of Health and the Iowa State Medical Society. The institute was for the practicing physician, the industrial physician and the industrial manager.

* * *

Dr. George W. Drexler, formerly of Minneapolis, is now associated with Dr. A. H. Borgerson and Dr. M. E. Mosby in the Long Prairie clinic and hospital.

Dr. Drexler, who was graduated from the University of Minnesota medical school and interned at General Hospital in Minneapolis, recently married Miss Frances Prinz of Long Prairie.

* * *

The grant of the National Foundation for Infantile Paralysis to the University of Minnesota for a course in orthopedic nursing has been renewed. Offered by the Department of Preventive Medicine and Public Health, this course will be given during the winter and spring quarters of the 1941-1942 term. It was offered for the first time last term.

(Continued on Page 792)

INTERNATIONAL MEDICAL ASSEMBLY

Inter-State Postgraduate Medical Association of North America

Public Auditorium, Minneapolis, Minnesota, October 13, 14, 15, 16, 17, 1941

Pre-Assembly Clinics, October 11; Post-Assembly Clinics, October 18, Minneapolis Hospitals

President, Dr. Roscoe R. Graham
President-Elect, Dr. George R. Minot
Managing-Director, Dr. William B. Peck*
Secretary, Dr. Tom B. Throckmorton
Director of Exhibits, Dr. Arthur G. Sullivan
Treasurer and Director of Foundation Fund, Dr. Henry G. Langworthy
Chairman, Program Committee, Dr. George W. Crile
General Chairman, Minneapolis Committees, Dr. Charles E. Proshek

ALL MEDICAL MEN AND WOMEN IN GOOD STANDING CORDIALLY INVITED

Intensive Clinical and Didactic Program by World Authorities

The following is the list of members of the profession who will take part on the program:

Frank E. Adair, New York, N. Y.
Alfred W. Adson, Rochester, Minn.
John Alexander, Ann Arbor, Mich.
Walter C. Alvarez, Rochester, Minn.
W. Wayne Babcock, Philadelphia, Pa.
Lewellys F. Barker, Baltimore, Md.
Claude S. Beck, Cleveland, Ohio.
E. T. Bell, Minneapolis, Minn.
Herrman L. Blumgart, Boston, Mass.
Peter T. Bohan, Kansas City, Mo.
William F. Braasch, Rochester, Minn.
Carl D. Camp, Ann Arbor, Mich.
James G. Carr, Chicago, Ill.
Richard B. Cattell, Boston, Mass.
Russell L. Cecil, New York, N. Y.
Frederick Christopher, Evanston, Ill.
Warren H. Cole, Chicago, Ill.
Frederick A. Coller, Ann Arbor, Mich.
C. Donald Creevy, Minneapolis, Minn.
William R. Cubbins, Chicago, Ill.
Elliott C. Cutler, Boston, Mass.
Walter E. Dandy, Baltimore, Md.
Robert S. Dinsmore, Cleveland, Ohio
Claude F. Dixon, Rochester, Minn.
Daniel C. Elkin, Atlanta, Ga.
John F. Erdmann, New York, N. Y.
A. Carlton Ernstene, Cleveland, Ohio.
Ernest H. Falconer, San Francisco, Calif.
Warfield M. Firor, Baltimore, Md.
John R. Fraser, Montreal, Canada
Henry J. Gerstenberger, Cleveland, Ohio.
Harry S. Gradle, Chicago, Ill.
Evarts A. Graham, St. Louis, Mo.
Roscoe R. Graham, Toronto, Canada.
Howard K. Gray, Rochester, Minn.
Robert G. Green, Minneapolis, Minn.
Russell L. Haden, Cleveland, Ohio.
Emile F. Holman, San Francisco, Calif.
Verne C. Hunt, Los Angeles, Calif.
Thomas E. Jones, Cleveland, Ohio.
Elliott P. Joslin, Boston, Mass.
Louis J. Karnosh, Cleveland, Ohio.
Chester S. Keefer, Boston, Mass.
H. Dabney Kerr, Iowa City, Iowa.
J. Murray Kinsman, Louisville, Ky.
Herman L. Kretschmer, Chicago, Ill.
Frank H. Lahey, Boston, Mass.
N. Logan Leven, St. Paul, Minn.
William E. Lower, Cleveland, Ohio
Charles W. Mayo, Rochester, Minn.
John L. McKelvey, Minneapolis, Minn.
John C. McKinley, Minneapolis, Minn.
Irvine McQuarrie, Minneapolis, Minn.
John J. Moorhead, New York, N. Y.
George P. Muller, Philadelphia, Pa.
Clay Ray Murray, New York, N. Y.
John H. Musser, New Orleans, La.
Horace Newhart, Minneapolis, Minn.
Emil Novak, Baltimore, Md.
Frank R. Ober, Boston, Mass.
Eric Oldberg, Chicago, Ill.
Paul A. O'Leary, Rochester, Minn.
Oliver S. Ormsby, Chicago, Ill.
Ralph Pemberton, Philadelphia, Pa.
Dallas B. Phemister, Chicago, Ill.
Isidor S. Ravdin, Philadelphia, Pa.
Hobart A. Reimann, Philadelphia, Pa.
Erwin R. Schmidt, Madison, Wis.
Elmer L. Sevringhaus, Madison, Wis.
George E. Shambaugh, Chicago, Ill.
Leroy H. Sloan, Chicago, Ill.
Thomas P. Sprunt, Baltimore, Md.
Virgil P. W. Sydenstricker, Augusta, Ga.
Willard O. Thompson, Chicago, Ill.
Maurice B. Visscher, Minneapolis, Minn.
Waltman Walters, Rochester, Minn.
Owen H. Wangensteen, Minneapolis, Minn.
Soma Weiss, Boston, Mass.
Henry M. Winans, Dallas, Texas
Wallace M. Yater, Washington, D. C.
Hugh H. Young, Baltimore, Md.

HOTEL HEADQUARTERS
Hotel Nicollet - Hotel Radisson

HOTEL RESERVATIONS

Hotel Committee: A. N. Bessesen, Jr., Chairman, 2000 Medical Arts Bldg., Minneapolis, Minnesota.

A program will be mailed to every member of the medical profession in good standing in the United States and Canada on or about September first.

Any member of the profession in good standing who does not receive a program, please write the Managing-Director and one will be mailed.

COMPREHENSIVE SCIENTIFIC AND TECHNICAL EXHIBIT. SPECIAL ENTERTAINMENT FOR THE LADIES

*Deceased, August 20, 1941

(Continued from Page 790)

Dr. Maurice N. Walsh of Rochester, as a member of the State Aeronautics Commission, is to be director of Minnesota's proposed glider pilot training program. The Legislative Advisory Committee has made $15,000 available to the commission for preparatory glider activities, if a similar amount be provided by the federal government, for which application has been made.

* * *

Dr. William Rademaker, Detroit Lakes physician, has terminated his association with Dr. H. W. Arndt in the Arndt Clinic in Detroit Lakes and has opened his own offices in that city. A graduate of the University of Minnesota Medical School, Dr. Rademaker formerly practiced in Evansville, and later was head of the bureau of sanatoria of the state division of social welfare. He came to Detroit Lakes last January.

* * *

Dr. David A. Sher of Minneapolis has become associated in the practice of medicine and surgery with Dr. M. M. Hursh in Hibbing, having offices at 1916½ Fourth Avenue East.

Dr. Sher practiced at Cold Spring, Minnesota for four years, and for the past year was in charge of the emergency receiving ward at Minneapolis General Hospital, while doing postgraduate work.

Dr. Philip C. Welton, on August 1, became superintendent of Buena Vista Sanatorium near Wabasha, succeeding Dr. R. R. Hendrickson who resigned to become superintendent of Lake Park Sanatorium near Detroit Lakes, Minnesota. Dr. Welton, formerly on the staff of Nopeming Sanatorium near Duluth, came to Wabasha from Salt Lake City where he was a Utah deputy state health officer.

Dr. K. J. Wakim, who is completing his fellowship in physiology in the Mayo Foundation and who received a degree of Ph.D. in physiology from the University of Minnesota in June, has been appointed associate professor of physiology at Indiana University. Dr. Wakim's teaching and research will be in clinical, fundamental and applied physiology at Bloomington and Indianapolis.

* * *

Among the speakers at the third biennial Rocky Mountain Medical Conference held at the Canyon Hotel in Yellowstone National Park, September 2-4, was Dr. Winchell McK. Craig of Rochester who presented a paper, "Rôle of the Protruded Intervertebral Disk in the Production of Low Back and Sciatic Pain; Reaction of the Central Nervous System to Trauma: Diagnosis and Treatment."

* * *

Dr. V. M. Baich of Minneapolis assisted in the offices of Drs. C. C. Craig and R. H. Monahan in International Falls last month during Dr. Monahan's absence from the city. Dr. Monahan vacationed in Boston and in eastern Canada.

A graduate of the University of Minnesota School of Medicine, Dr. Baich interned at Deaconess Hospital in Minneapolis. He expects to leave soon to accept a commission in the United States Navy.

* * *

Members of the Medical Reserve Corps who have been called to active duty during the past few weeks include:

W. Lee Raverty of Blue Earth, first lieutenant.

Hilbert Mark of Minneapolis, major, to Carlisle Barracks, Pennsylvania.

R. C. Hottinger of Janesville, first lieutenant, to Fort



George Wright at Spokane, Washington.
W. E. Anderson of Thief River Falls, captain, to Carlisle Barracks, Harrisburg, Pennsylvania.
Carroll Joseph Bellis of Saint Paul, first lieutenant.
Laurence Mercer Hursh of Hibbing, first lieutenant.
Reuben Berman of Minneapolis, captain.
Lyle Albert French of Minneapolis, first lieutenant.

* * *

Appointment of Dr. D. E. McBroom, superintendent of the Minnesota Colony for Epileptics at Cambridge, as director of a program of mental hygiene and mental testing in the state division of public institutions, is announced by Carl H. Swanson, state director of public institutions.

Dr. Royal C. Gray of Minneapolis, who has served as psychiatrist of state penal institutions since 1938, has been named to succeed Dr. McBroom as acting superintendent. He has been responsible for several years for active conduct of the neuro-psychiatric service at the University Hospitals.

The appointments were effective September 1.

Dr. McBroom, who served as president of the East Central Minnesota Medical Society this year, is a former member of the staff at the School for Feeble-Minded at Faribault and was assistant superintendent from 1922 to 1928, when he was named superintendent of the Cambridge institution.

* * *

From Captain Malcolm R. Johnson, who is doing eye, ear, nose and throat work at the U. S. Army Station Hospital, Fort Riley, Kansas, comes a letter telling of Minnesota medical activities there. He writes:

"Lt. Col. R. W. Whittier, who is head of the department, is a Minnesota graduate. He at one time worked under Dr. Frank Burch. . . My associations here have been very pleasant, and in my practice I have seen an enormous variety of interesting cases. Since our two nurses are from Minnesota too, we have a Minnesota Clinic in the heart of Kansas. Incidentally, our advertisement for Minnesota should rate applause from the Chamber of Commerce."

Captain Johnson practiced at the Interstate Clinic at Red Wing, specializing in eye, ear, nose and throat, before being called to active duty, April 1. He completed his fellowship training at Minneapolis General Hospital last December.

* * *

Dr. Clarence M. Jackson, professor and head of the department of anatomy at the University of Minnesota Medical School, retired at the close of the school year and has been appointed professor emeritus in the department of anatomy. A committee consisting of the following professors has been appointed to administer the department for the coming year: Dr. Edward A. Boyden, chairman, Dr. Andrew T. Rasmussen, and Dr. Hal Downey.

The following members of the faculty retired at the close of the school year: Dr. J. Frank Corbett and Dr. Harry P. Ritchie as clinical professors of surgery; Dr. Walter R. Ramsey, as clinical associate professor of pediatrics; Dr. Orianna McDaniel, as clinical associate professor of preventive medicine and public health; and Dr. Anton G. Wethall, as clinical assistant professor of urology.

In addition, Dr. Horace Newhart, professor of oto-



St. Petersburg, Russia

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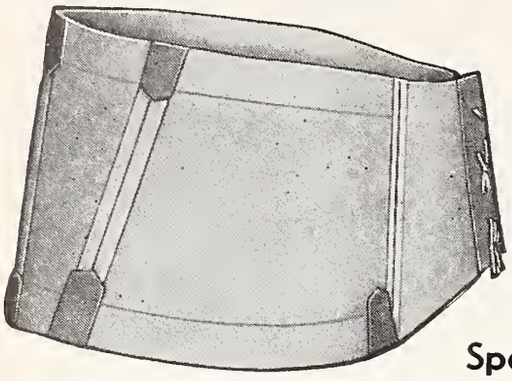
* Trade Mark Reg. U. S. Pat. Off. Word "Vioform" identifies the product as iodochloroxyquinoline of Ciba's manufacture.
1 Craig, C. F.: Amebiasis and Amebic Dysentery (1934).
2 Zener, F. B., Am. Jl. Surg. 44:416 (1939).

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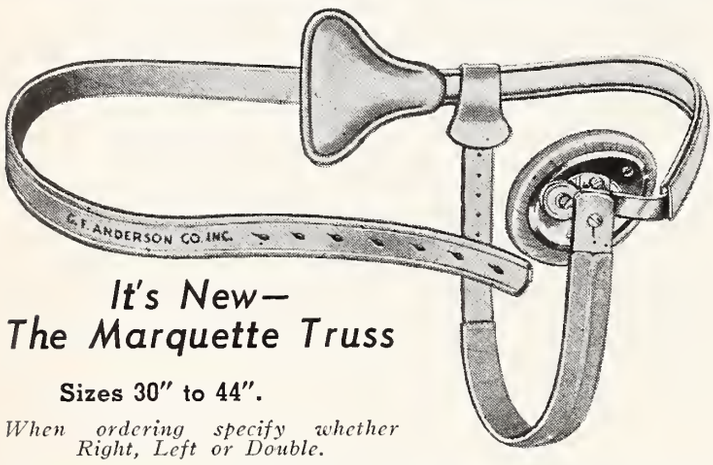
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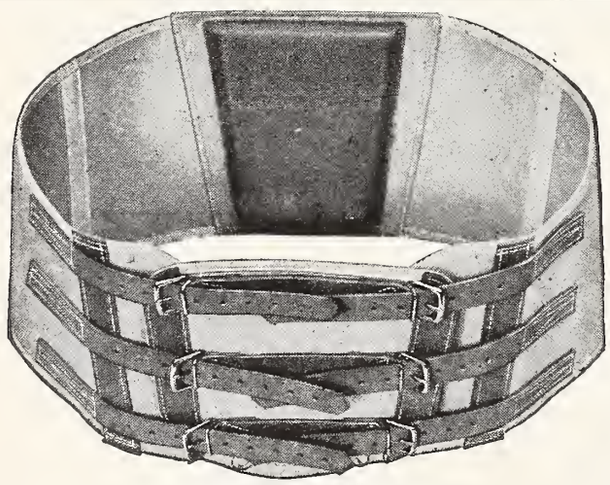
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laryngology and director of the Division of Otology, Rhinology and Laryngology; and Dr. Charles A. Reed, associate professor of orthopedic surgery, resigned from the medical faculty, after many years of service, to devote their time to private practice.

* * *

Five Range physicians, formerly associated with the Rood Hospital system, have purchased the interests of Dr. D. C. Rood, Duluth, retired, and have organized what will be known as the Mesaba Clinic with headquarters in Hibbing. In addition to the new clinic now under construction in Hibbing, the group will operate the Rood Hospital in Chisholm, and dispensaries at Coleraine, Marble, Calumet and Keewatin. The five physicians are Drs. R. L. Bowen, T. A. Estrem, C. F. Carstens of Hibbing; and Dr. E. K. Rowles of Coleraine; and Dr. P. H. MacFarlane of Chisholm.

Associated with them will be Dr. F. E. Giles, Dr. C. W. Ahl, Dr. A. C. Tingdale and Dr. E. W. Zeman of Hibbing; Dr. A. D. Klein and Dr. W. H. Parker of Chisholm; Dr. E. T. Plowman of Marble; Dr. I. H. Kiesling of Coleraine; and Dr. E. H. Loofbourrow of Keewatin. G. H. Hepworth of Hibbing has been named business manager of the clinic.

Dr. Rood, who retired from active practice several years ago, is living in Duluth. He came to the Range in the early days and opened a hospital in a frame building in North Hibbing. As the mining industry expanded, he constructed and maintained offices and hospitals at Calumet, Coleraine, Marble, Nashwauk, Chisholm and Keewatin.

* * *

Medical officers on duty with National Guard units of Minnesota, as listed by headquarters, include:

Einar C. Andreassen, Major, Minneapolis, 135th Infantry (R), Camp Claiborne, La.

Stanley F. Ceplecha, Captain, Redwood Falls, 215th Coast Artillery (AA), Camp Haan, Calif.

Ralph H. Creighton, Captain, Minneapolis, 135th Infantry (R), Camp Claiborne, La.

William J. Eklund, Major, Duluth, 125th Fld. Artil., Camp Claiborne, La.

John S. Hamlon, Capt., St. Charles, 135th Inf. (R), Camp Claiborne, La.

Richard B. Hullsiek, Lieut. Colonel, St. Paul, MD State Staff.

Wyman E. Jacobson, Captain, Minneapolis, 135th Infantry (R), Camp Claiborne, La.

Vilhelm M. Johnson, Captain, Dawson, 135th Inf. (R), Camp Claiborne, La.

Youbert T. Johnson, Major, Minneapolis, 109th Obsn. Squadron.

Herbert W. Jones, Jr., Captain, Minneapolis, 151st Field Artillery, Camp Claiborne, La.

Jacob F. Karn, Captain, St. Paul, 138th Infantry.

Linus F. Leitschuh, 1st Lieut., Red Lake Falls, 217th Coast Artillery (AA).

John D. Lyon, Jr., Captain, Minneapolis, 151st Field Artillery, Camp Claiborne, La.

Leopold G. Samuelson, Major, Mankato, 218th Coast Artillery (AA).

George F. Schmidt, Lieut. Colonel, Minneapolis, 151st Field Artillery, Camp Claiborne, La.

Alf K. Stratte, Captain, Pine City, 125th Field Artillery, Camp Claiborne, La.

Sofus E. Urberg, Capt., Duluth, 125th Fld. Artillery, Camp Claiborne, La.

George A. Williamson, Major, St. Paul, 216th Coast Artillery (AA), Camp Haan, Calif.

Howard H. Wolfe, Captain, St. Paul, 216th Coast Artillery (AA), Camp Haan, Calif.

* * *

Among the fifty new fellows in the Mayo Foundation are: Dr. John H. Flinn of Redwood Falls, who was graduated from Northwestern University School of Medicine and who interned at St. Luke's Hospital in Chicago and at Ancker Hospital in Saint Paul; Dr.

(Continued on Page 802)

In Memoriam

Jane Hughes Sullivan

Dr. Jane Hughes Sullivan, a practicing physician at Mankato for over a decade and wife of Michael F. Sullivan of Mankato, died suddenly July 29, 1941, at the age of seventy-one. She was the sister of the late Dr. Helen Hughes Hielscher, also of Mankato.

Dr. Sullivan was born at Bedford, P. E. I., Canada, on July 17, 1870, and when a young girl moved to Blue Earth, Minnesota.

She began practice as Dr. Jane Hughes at Mankato in 1902 after receiving her medical degree at the University of Michigan the same year. She continued her practice until about two years after her marriage in 1912 to M. F. Sullivan. During the early years she was in partnership with Dr. J. A. Andrews and Dr. J. S. Holbrook, and later with her sister, Dr. Helen Hielscher. She and her sister founded the Monday Study Club, an organization of Catholic women in Mankato, which celebrated its twentieth anniversary in 1940 and whose membership had grown to thirty during this period.

Surviving are her husband, a daughter Helen, now Sister Mary of Our Lady of Grace, of the Sisters of the Good Shepherd, at Omaha, and a son, Dr. John Sullivan, of Mankato.

Joseph R. Kuth

Joseph R. Kuth died in Duluth, at the age of sixty, on August 1, 1941, as a result of lymphatic leukemia. The disease ran a rather chronic course for about four years, but an acute fulminating erythroblastic bone marrow depression caused a rapid decline within a period of four weeks.

J. R. Kuth came from sturdy German stock, and was born in Hartford, Wisconsin. His family moved to Minneapolis at an early date, but he received his preliminary education at St. John's College, near St. Cloud, Minnesota. He was reported as notably brilliant in his classical studies, and maintained throughout his life the keenest interest in the best of the world's literature. He was a particularly keen student of historical events.

His medical education was received at the University of Minnesota, where he graduated in 1904, and came immediately to St. Mary's Hospital, Duluth, as an intern.

In Duluth he came in contact with the late gifted Dr. W. H. Magie, a pioneer surgeon in northern Minnesota, whose practice had a notable number of industrial injuries. Dr. Kuth practiced with Dr. Magie for five or six years in his industrial work, and no doubt that led him into the chosen specialty of orthopedic surgery.

In 1913 and 1914 he did postgraduate work in Austria, Germany and England, and had very close contact with the great Lorenz and the productive school of orthopedists at Liverpool, England. Returning to Duluth, he confined his practice entirely to orthopedic surgery, and with a temperament and intellectual capacity greatly like the late Emil Geist, he had, throughout his life, the greatest confidence of his patients, the respect of the medical profession, and with the Industrial Commission (apropos of many accident cases submitted to him for review) his word carried unusual conviction.

He was honored by medical societies by various offices, and at one time was Chief of Staff for St. Mary's Hospital, Duluth. He was a member of the American Board of Orthopedic Surgery and the Clinical Orthopedic Society and the American Academy of Orthopedic Surgeons.

E. L. Tuohy



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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

INFANTILE PARALYSIS. A Symposium delivered at Vanderbilt University, April, 1941 (Six lectures). 239 pages. Illus. Price $1.25, cloth. Baltimore: Waverly Press, Inc., 1941.

DOCTORS DON'T BELIEVE IT—WHY SHOULD YOU? Facts and Fallacies About Health with Practical Guidance for the Layman. August A. Thomen, M.D. Introduction by Logan Clendening, M.D., and the Right Honorable Lord Horder, Physician in Ordinary to the King of England. 384 pages. Price, $2.50, flexible binding. New York: Simon & Schuster, 1941.

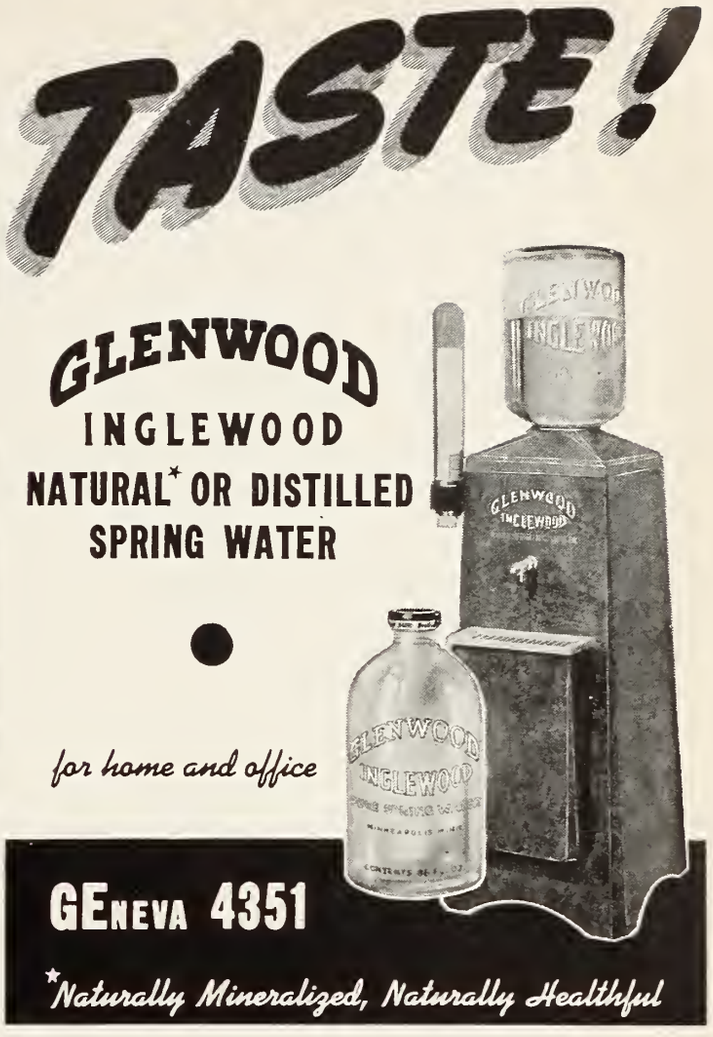
LYMPHATICS, LYMPH AND LYMPHOID TISSUE. Their Physiological and Clinical Significance. Cecil Kent Drinker, M.D., D.Sc., Prof. of Physiology, School of Public Health, Harvard University; and Joseph Mendel Yoffey, M.Sc., M.D., F.R.C.S. (Eng.), Senior Lecturer in Anatomy, University College of South Wales and Monmouthshire, Cardiff, Wales. 406 pages. Illus. Price, $4.00, cloth. Cambridge, Mass.: Harvard University Press, 1941.

COMMUNITY ORGANIZATION FOR HEALTH EDUCATION. Report of a Committee of the Public Health Education Section and the Health Officers Section of the American Public Health Association. 120 pages. Illus. Price 9c, paper cover. Cambridge, Mass.: The Technology Press, 1941.

THE CARE OF THE AGED. (Third Edition) Malford W. Thewlis, M.D. Attending Specialist, General Medicine, United States Public Health Hospital, New York City; Attending Physician, South County Hospital, Wakefield, R. I.; Special Consultant, Rhode Island Department of Public Health. 579 pages. Illus. Price, $6.00, cloth. St. Louis: C. V. Mosby Co., 1941.

NECROPSY—A Guide for Students of Anatomic Pathology. Bela Halpert, M.D. Assistant Professor of Pathology and Bacteriology, Louisiana State University School of Medicine, and Visiting Pathologist, Charity Hospital of Louisiana, New Orleans. 75 pages. Price, $1.50, cloth. St. Louis: C. V. Mosby Co., 1941.

PRINCIPLES OF MICROBIOLOGY. Francis E. Colien, B.S., M.S., Ph.D., F.A.P.H.A. Associate Professor of Bacteriology and Preventive Medicine in the Creighton University School of Medicine; Lecturer in Public Health and Preventive Medicine, Creighton Memorial, St. Joseph's Hospital School of Nursing; Director of Laboratories, Health Dept., City of Omaha; Major, Sanitary Division, U. S. Army Medical Reserve; Formerly Professor of Bacteriology and Preventive Medicine in the Central School of Nursing, Milwaukee. And Ethel J. Odegard, R.N., A.B., M.A. Instructor in Sciences Applied t Nursing, College of St. Theresa, Winona, Minnesota; formerly Director of Nursing Education in Central School of Nursing, Milwaukee; Education Director Miami Valley Hospital School of Nursing, Dayton, Ohio. 444 pages. Illus. Price, $3.00, cloth. St. Louis: C. V. Mosby Co., 1941.



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A TEXTBOOK OF BACTERIOLOGY. Third Edition. R. W. Fairbrother, D.Sc., M.D., M.R.C.P. Director of the Clinical Laboratory, Manchester Royal Infirmary; Special Lecturer in Bacteriology, University of Manchester; Major, R.A.M.C.; Late Research Fellow in Bacteriology, Lister Institute, London. 451 pages. Illus. Price, $5.00, cloth. St. Louis: C. V. Mosby Co., 1941.

ESSENTIALS OF PHARMACOLOGY AND MATERIA MEDICA FOR NURSES. Albert J. Gilbert, M.D. Instructor of Pharmacology, Aultman School of Nursing, Canton, Ohio; formerly Instructor of Pharmacology and Therapeutics, John Sealy College of Nursing; formerly Instructor of Pharmacology, University of Texas Medical School, Galveston; and Selma Moody, R.N. Instructor in Nursing Arts, Presbyterian Hospital of the City of Chicago. 251 pages. Illus. Price, $2.25, cloth. St. Louis: C. V. Mosby Co., 1941.

HEMORRHAGIC DISEASES: PHOTO-ELECTRIC STUDY OF BLOOD COAGULATION. Kaare K. Nygaard. St. Louis: The C. V. Mosby Company, 1941. 320 pages. Illus. $5.50.

The author, who is well known in Minnesota, has been a fellow in surgery at the Mayo Clinic. During this time he wrote many papers on the coagulation of the blood. In the present volume he summarizes his investigations on the coagulability of the blood which were carried out by the photo-electric method. He began analyzing the clotting phenomenon of recalcified plasma with this method in 1935 and has subsequently applied it to many of the hemorrhagic diseases.

In the first part of the book he describes his method and the results he has obtained with it. In measuring the clotting time of recalcified blood plasma he has found that there are four phases:

1. The period of dissociation comprising the interval from the beginning of the reaction to the first formation of fibrin.

2. The period of fibrin formation comprising the entire continuous process.

3. The rest period.

4. The period of clot retraction.

A fifth factor, the amount of fibrin formed, can also be measured, Nygaard has not followed up this phase, however. Microscopic studeies revealed a change in the size and outline of the platelets with clumping preceding the actual formation of fibrin. He believes that the velocity of the process of blood coagulation is a relative expression of the velocity of thrombin formation.

In the second part of the book he presents a classification of hemorrhagic manifestations. He divides his classification into two principal groups:

A. Hemorrhagic manifestations of non-hematologic origin, i.e., vascular.

B. Hemorrhagic manifestations of hematologic origin, i.e., disturbances of the clotting mechanism.

He does not classify hemorrhagic diseases per se because the lack of information concerning the etiology and pathology of many of them does not allow definite

delineation as an entity. With his method he has studied the clotting of the plasma in hemophilia, thrombocytopenic purpura, vitamin K deficiency, hemorrhagic disease of the newborn, and the hemorrhagic tendency in the disease of the gall bladder, bile ducts, pancreas and liver. His findings agree with those of previous observers in regard to the vitamin-K-prothrombin mechanism. He thinks hemophilia is due to a quantitative deficiency of thromboplastin in the plasma, combined with a qualitative deficiency of the platelets. He has also confirmed Gram's findings that there is a hypocoagulability of the blood plasma in thrombocytopenia.

This is not a text book. It is a very thorough monograph with complete bibliography on the photo-electric method of studying blood coagulability and the results obtained thereby.

Wm. D. Coventry, M.D.

NEW and NONOFFICIAL REMEDIES, 1941. Containing descriptions of the articles which stand accepted by the Council on Pharmacy and Chemistry of the American Medical Association on Jan. 1, 1941. Cloth. Price, postpaid, $1.50. Pp. 691—LXX Chicago: American Medical Association, 1941.

"New and Nonofficial Remedies" is the book in which are described the medicinal preparations found by the Council on Pharmacy and Chemistry to be acceptable for the use of physicians. The book is cumulative; each year there are added the descriptions of products accepted during the foregoing year. Those taken off the market or found no longer worthy of continued acceptance are deleted. The book is at that time also revised to bring it up to date with the most recent medical thought. Until recent years the additions and deletions have about balanced. Recently, however, the bulk of the book has been increasing and this year's volume represents the largest book of the more than thirty volumes that have been issued.

This year's new additions include the new sulfanilamide derivative, sulfathiazole, as well as sulfapyridine sodium; antipneumococcic rabbit serum of types I, II, III, V, VII and VIII; human convalescent measles serum and human convalescent scarlet fever serum; and staphylococcus antitoxin. The field of endocrinology is represented by the addition of chorionic gonadotropin (follutein). The addition of shark liver oil reflects the search for new sources of vitamins A and D caused by the cutting off of foreign cod liver oil. Other newly accepted preparations are ampules of camphor, digilanid and magnesium trisilicate.

The most extensive revision is represented by the rearrangement and amplification of the chapter, Serums and Vaccines. This chapter is now prefaced by a helpful index, an innovation in N.N.R. The chapter, "Vitamins and Vitamin Preparations for Therapeutic and Prophylactic Use" has been revised to keep it abreast of the newer developments in this field. Here, too, we find something of an innovation in the systematic use of graphic chemical formulas. It is understood that this practice will be extended to other

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parts of the book in future editions. Careful perusal will reveal minor revisions in many parts of the book made in the interest of greater clarity and in the effort to keep the book thoroughly up to date.

ANNUAL REPRINT OF THE REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY F THE AMERICAN MEDICAL ASSOCIATION FOR 1940. Cloth. Price, $1.00. Pp. 181. Chicago: American Medical Association, 1941.

This volume contains not only all of the published reports of the Council for the preceding year but also reports on products which were not deemed important enough to be published in THE JOURNAL. Council reports may be classified in general as those of omission or rejection, preliminary reports and status reports on drugs or on various therapeutic and pharmacologic problems. Representatives of all classes appear in this volume.

There are a number of interesting reports in the "nonacceptable" category. The one on the widely exploited Neurosine of the Dios Company sounds a timely warning on the hazards of bromidism and uncontrolled hypnotic medication. The report rejecting a number of preparations of gonadotropic hormone from the serum of pregnant mares, together with the report rejecting certain ovarian and anterior pituitary preparations, attest the Council's continued critical interest in the field of endocrinology. This is also indicated in the report on Desoxycorticosterone, written by Doctor Edgar S. Gordon and adopted by the Council for publication with a statement of the Council's attitude on the present status of adrenal cortex. The Council finds adrenal cortex therapy now in an unsatisfactory and unsettled state.

Two reports relegate to the therapeutic scrap heap, the drugs Isacen and Melubrin: Isacen was accepted in 1926 as a nontoxic laxative or purgative; Melubrin is an anti-pyretic which seemed to have promise when it was accepted in 1913 but which the manufacturer has now ceased marketing. It is interesting to note that at the time these preparations were accepted the Council expressed some misgiving which later proved justified.

Noteworthy preliminary reports are on Guanidine Hydrochloride-Calco, which has been proposed for use in the treatment of myasthenia gravis, and Acetylglycarsenobenzene, a new antisyphilitic for intramuscular use, which the Council feels should be further perfected. In its report the Council comments with approval upon the manner in which the Winthrop Chemical Company has developed the latter and studied it before even considering its commercial production.

Among the nomenclature reports are those designating "Pyridoxine" and "Pyridoxine Hydrochloride" for Vitamin B_6 and Vitamin B_6 Hydrochloride; "Sulfathiazole" for 2-Sulfanilamidothiazole and "Sulfamethylthiazole" for 2-Sulfanilamido-4-Methylthiazole. Preliminary reports on these drugs as well as on Phenothiazine and Histaminase are included.

It is difficult to choose any among the so-called status reports for special mention—all are noteworthy for one reason or another. The report on the present

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status of the injection treatment of hernia is a continuation of the Council's consideration of this question. The Council has reached the decision that it is necessary to condemn the exploitation of the injection treatment of hernia by manufacturers of solutions.

Another status report that must be mentioned is that on Lipocaic, a new pancreatic hormone concerned in some way with the normal transport and utilization of fat. The Council awaits developments of further clinical evidence for Lipocaic and expressed the opinion that the method should not be recognized for routine practice.

Mention must be made of the excellent report on organic mercurial compounds as bactericidal agents, which states the Council's conclusion that no organic mercurial compound has yet been offered that will guarantee the destruction of spores under all conditions.

Another valuable report is that on the promiscuous use of the barbiturates. This is a continuation of a previous study of the use of barbiturates in suicide. The present study is an analysis of hospital data.

One cannot even glance through a volume such as this without reflection on the great value of the Council on Pharmacy and Chemistry's work, which so richly deserves the support of all who are interested either directly or indirectly in the progress of medicine.

PARADUODENAL HERNIA

(Continued from Page 783)

It was in a man sixty-three years old, who first claimed never to have had an injury, but on closer questioning remembered that when seventeen years old he was knocked over by the beam of a stump puller. When the stump, secured by a heavy chain and fastened to a long beam, was twisted out of the ground, two horses pulling on the outer end of the beam, the harness broke and there was a terrific blow that knocked the boy over. He was sick for some weeks, but then got over it. He had broken some ribs but later apparently had not had any very serious discomfort except at times considerable epigastric pain. His gall bladder had been removed a short time before I saw him. There were no stones and the patient was no better.

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The meeting adjourned.

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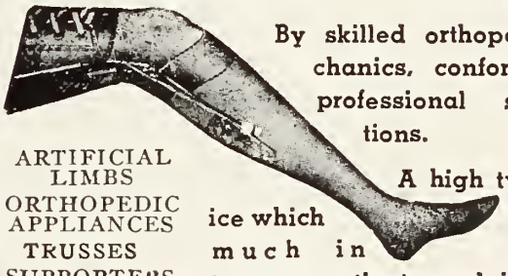
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OF GENERAL INTEREST

(Continued from Page 794)

Walter F. Larrabee, Jr., of Chippewa Falls, Wisconsin, who was graduated from the University of Minnesota School of Medicine and who interned at the University of Minnesota Hospitals; Dr. Leonard L. Lovshin of Chisholm, graduate of the University of Wisconsin medical school; Dr. C. Naumann McCloud, Jr., of Saint Paul, graduate of the University of Minnesota medical school and intern at Ancker Hospital in Saint Paul.

Also, Dr. Frederick M. Stark of Saint Paul, a graduate of the University of Minnesota medical school; Dr. Charles P. Marvin of Saint Paul, graduate of the University of Minnesota medical school and intern at Ancker Hospital in Saint Paul; Dr. Vincent F. Swanson of Minneapolis, graduate of Northwestern University medical school who interned at Minneapolis General Hospital and was resident in anesthesia at University of Minnesota Hospitals; Dr. Collin S. MacCarty of Rochester, a graduate of Johns Hopkins University medical school and intern at Johns Hopkins Hospital; Dr. Kenneth G. Wilson of Minneapolis, graduate of University of Minnesota medical school who served his interneship at St. Luke's Hospital in San Francisco.

Dr. Robert C. Brown of Fargo, North Dakota, a Cole Exchange Fellow in orthopedic surgery from the University of Minnesota, is with Dr. M. S. Henderson and his associates.

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ROENTGENOLOGICAL MANIFESTATIONS OF INJURIES TO THE CHEST*

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YOUR invitation to deliver the Carman Lecture carries with it, to me, a feeling of special significance. It was Dr. Russell Carman, who, in 1912 as roentgenologist for Washington University Medical School, first demonstrated the wonders of roentgenological examination to me while I was still a student in Medical School. I shall never forget the feeling of awe and bewilderment which we experienced as we huddled in the darkened x-ray room awaiting a demonstration of the fluoroscope; nor the sensation of amazement as we beheld the wonders of this new diagnostic agent. Myriads of high tension sparks danced overhead along the high tension wires like messengers conveying their energy to the x-ray tube; the yellowish green fluorescence of the tube itself and the pale light from the fluoroscopic screen lent a sinister hue to the surroundings producing a cadaverous look on the faces of the examiners as they peered into the innermost depths of the patient's body. Little wonder that the demonstration of such a mysterious agent should make a deep impression on a student, and inspire him to seek a career in roentgenology.

Russell D. Carman was a pioneer in roentgenology, who through his careful observations and his analytical deductions made valuable contributions to our knowledge of this science. His greatest accomplishment was in the field of gastro-intestinal roentgenology, and his monograph on this subject brought him recognition from all over the world. It is fitting, therefore, that we should preserve the memory of this great man by a lecture in his honor. Modest and retiring as he was, I am sure that he would prefer that we should proceed, without further recitation of his accomplishments, to a consideration of some phase of roentgenological practice which might stimulate others to further accomplishment in the field which he loved so well.

The subject which I have chosen for my address this afternoon is, I think, a very timely one. The modern tendency toward high speed transportation and intensive methods of mass production in industry has resulted in a great increase in bodily injuries, both to workmen and to the public.

Among the most important of these are thoracic injuries. Injuries to the chest are of such importance because of the liability of injury to, or interference with, the vital organs which it contains. The chest wall is extremely elastic and ordinarily withstands considerable trauma without injury to the underlying organs; on the other hand, it is surprising what apparently slight trauma may result in injury to the lung.

Given a case in which there has been external trauma to the chest, I shall endeavor to point out briefly the various injuries which he may have sustained and to show how roentgenographic examination may aid in their detection.

A. Effects of External Violence (Trauma from Without).

1. Injuries to the Chest Wall;
   (a) Contusion or Laceration of the Chest Wall,
   (b) Subcutaneous Emphysema,
   (c) Fractured Ribs.

2. Injuries to the Pleura;
   (a) Traumatic Pleurisy,
   (b) Subpleural Hematoma,
   (c) Hemothorax.

*The Russell Carman Memorial Lecture presented before the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 27, 1941.

3. Injuries to the Lung;
   (a) Interstitial Pulmonary Hemorrhage,
   (b) Traumatic Pneumothorax,
   (c) Massive (Atelectatic) Collapse of the Lung.

4. Injuries to the Mediastinum;
   (a) Gun Shot Wound.

5. Injuries to the Diaphragm;
   (a) Diaphragmatic Hernia.

require roentgenographic examination if it were not for the possibility of associated injury to the thoracic organs. In any given case, however, where trauma to the chest has occured, it is well to have a roentgenographic examination of the thorax; even if at the time it shows no abnormality it will serve as a basis of comparison for any subsequent condition which might develop.

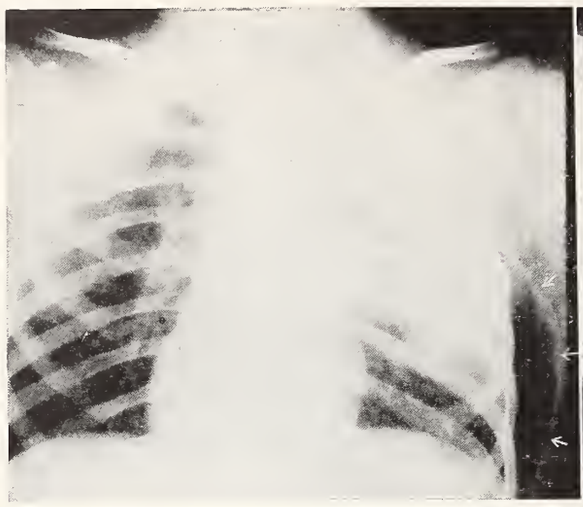


Fig. 1. Subcutaneous emphysema with interstitial pulmonary hemorrhage due to fracture of the ribs from an automobile accident. Note large pocket of air in subcutaneous tissues.

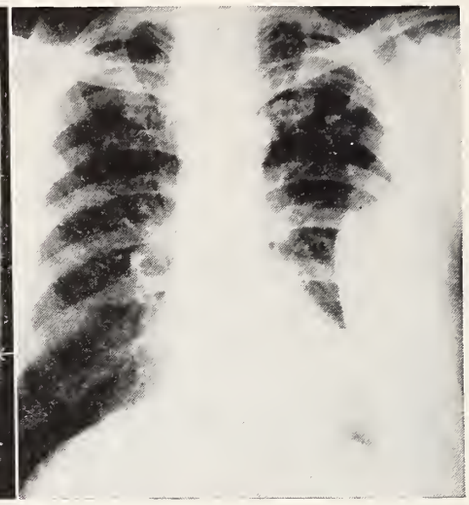


Fig. 2. Subpleural hematoma caused by injury from a batted ball received at twelve years of age. The organized hematoma has persisted into adult life.

External trauma applied to the chest may result in any of these conditions alone, or in almost any combination.

We shall endeavor, in each instance, to indicate the circumstances under which they most frequently occur, and to point out the roentgenographic signs by which they can be recognized.

As a basis for this study, 381 cases of trauma to the chest, which were treated at the St. Louis City Hospital, and St. Mary's Hospital, over a seven-year period will be referred to. Of these, 102 cases were associated with fracture of the ribs sufficiently serious to require hospitalization, 243 cases were of stab wounds and gunshot wounds from a previous study,[3] as examples of more direct, less complicated injury to the lung. These will not be presented as a statistical study, but will be mentioned from time to time to illustrate more clearly various clinical phases of the subject.

Injuries to the Chest Wall—Effect of External Violence

Contusions or Lacerations.—First of all, simple contusion or laceration of the chest wall is one of the most frequently encountered injuries to the chest. It rarely causes difficulty and would not

Subcutaneous Emphysema.—Air in the subcutaneous tissues is relatively common (Fig. 1.), occuring in 15 to 20 per cent of patients with fractured ribs and lacerated wounds of the thorax. It usually remains localized and does not cause any serious consequences. Occasionally, under unusual circumstances, in a lacerated wound of the chest wall, air may be entrapped with each respiratory movement and pumped out into the subcutaneous tissues, resulting in subcutaneous emphysema of serious proportions.

Such involvement may extend beneath the fascia planes to envelope the entire body, extending into the neck and mediastinum, and jeopardizing the life of the individual. In one case of our series subcutaneous emphysema came on from coughing three weeks after injury. Air in the subcutaneous tissue is easily recognized roentgenographically by its lessened density as it appears along the various fascia planes. Fortunately this is usually easily controlled and only rarely presents involvement of serious proportions.

Fractured Ribs.—Perhaps the type of injury which is most frequently encountered is fracture of the ribs (Fig. 5). One would think that, being a bony injury, a fractured rib would always be

readily detectable by roentgenographic examination. While this is true under most circumstances, yet under certain conditions fractured ribs may be very difficult to detect. This may be due to the numerous linear shadows produced by the lung structures which pass over the ribs closely resembling fracture lines or it may be due to the location and character of the fracture. If for instance the fracture is in the axillary line it may not be detectable in the ordinary anterior or posterior views of the chest and special detailed views over the site of maximum injury may be required to demonstrate the fracture. Then again, if the location of an injury is near the sternal attachments of the ribs it must always be borne in mind that the cartilaginous portions of the ribs may not show evidence of injury in the roentgenogram. At times, the distinct crepitus attained by physical examination may be a more reliable guide for the detection of simple fracture than the roentgen examination.

Usually fractured ribs are simple, unattended with serious complications, but occasionally this may not be the case. Death may occur from embolus several days later. Rupture of an intercostal artery may result in extensive and even fatal hemorrhage.

Death under such conditions may occur suddenly, or hemorrhage from this source may come on several days after simple fracture even where roentgenographic examination at the time of injury failed to reveal any evidence of fluid in the chest cavity. Such an instance was encountered in a sixty-five-year-old man, who died suddenly three days after a fractured rib, from hemorrhage. Multiple fractures of the ribs are usually associated with crushing injuries. Under these conditions the injury to the underlying lung structure is of greater importance than the fractures themselves. In 18 per cent of the patients in our series fractured ribs were associated with varying degrees of hemorrhage into the lung and hemothorax.

Injuries to the Pleura

Traumatic Pleurisy.—There is, of course, some injury to the pleura whenever a rib is fractured. Injury to the chest wall, however, may result in traumatic pleurisy even without associated fracture of the ribs. Clinically, this condition is manifested by acute pains on deep inspiration coming on from three to six days after injury. Traumatic pleurisy manifests itself as a thickening of the pleura, either localized to the site of trauma, or involving the entire parietal pleura. Roentgenographically, thickening of the pleura appears as a ribbon-like shadow extending along the parietal chest wall. This appearance is explained by the fact that the thickened pleura forms an upright cylindrical structure so that a greater thickness of the pleura is viewed on the lateral than on the anterior or posterior chest wall. If the pain is severe, immobilization of the diaphragm on the affected side may occur in a high position. This splinting of the diaphragm is a defense reaction against pain. The inflammation usually subsides within a few days or a week, and the roentgen picture returns to normal. Only rarely, in severe instances, does pleural effusion result.

Subpleural Hematoma.—A rather unusual occurrence with injury to the chest wall is the development of a localized pleural hematoma from hemorrhage under the parietal pleura. Such collections of blood produce roentgen findings similar to localized collections of pleural exudate which frequently occur from infection. The pressure of the blood produces a rounded enlargement pressing inward toward the compressible lung. Such collections of blood may remain unabsorbed for long periods of time and may be ultimately replaced by fibrous tissue or by large plaques of calcium deposit.[2] For hemorrhagic areas to undergo organization and calcification, the hemorrhage most frequently involves the interstitial or intramuscular tissue. It is questionable if blood free in the pleural cavity ever undergoes organization. We have observed a patient (Fig. 2) showing such a subpleural hematoma for a long period, who gave a history of injury to the chest by a batted ball at twelve years of age. He came under our observation first at thirty-seven years of age and the condition has showed no change over the last eight years.

Hemothorax.—Hemothorax usually results from damage to the lung as the result of a crushing injury to the chest wall or a penetrating wound of the chest, or from rupture of an intercostal artery following fracture of a rib. Hemothorax may occur from injury to the diaphragm and underlying abdominal viscera or from injury to the heart or mediastinum, usually under such circumstances from a penetrating wound.

Clinically, the immediate symptoms are more

from loss of blood than the accumulation of fluid in the chest. Blood does not clot as readily in the pleural cavity as it does elsewhere in the body, however, and the bleeding may continue for many days or weeks. Fluid blood may be aspirated from the chest cavity as long as three months after injury. Roentgenographically hemothorax, when fully established, presents no difference in appearance from ordinary pleural effusion, the density of blood being so nearly the same as other fluid (Fig. 3*A* and *B*). Free fluid in the pleural cavity presents a dense homogeneous shadow in the lower portion of the chest cavity with a hazy concave upper border extending from the hilum region upward and outward toward the axilla. The hazy curved upper border is explained in the following manner: as fluid accumulates in the lower portion of the chest it displaces an equivalent volume of lung structure, expressing sufficient air from the lung by pressure to equalize this amount. The distended air-filled lung presents an elastic body for the fluid to press against, attached only at the hilum of the lung and free to move at the periphery. It is only natural therefore that the lung should be floated upward more readily at the periphery with the development of a curved border. If associated with pneumothorax, the positive air pressure in the pleural cavity results in collapse of the lung, thereby removing the elastic body for the fluid to press against which in turn results in the establishment of a straight line fluid level.

Shortly after injury, however, hemothorax may not take on the classical appearance of pleural effusion. The slow escape of blood from a localized point in the lung or pleura permits it to spread itself out in a thin layer between the surface of the lung and the parietal chest wall producing a diffuse hazy appearance over the entire lung field. At this stage the density is not sufficient to obliterate the shadows of the ribs. Later, however, with the gravitation and collection of the blood in the most dependent portion of the chest, it takes on the appearance of an ordinary pleural effusion. Rarely is there displacement of the mediastinal structures. When mediastinal displacement is present it indicates a serious condition since a sufficient amount to cause shift of the mediastinal structures represents a dangerous loss of blood.

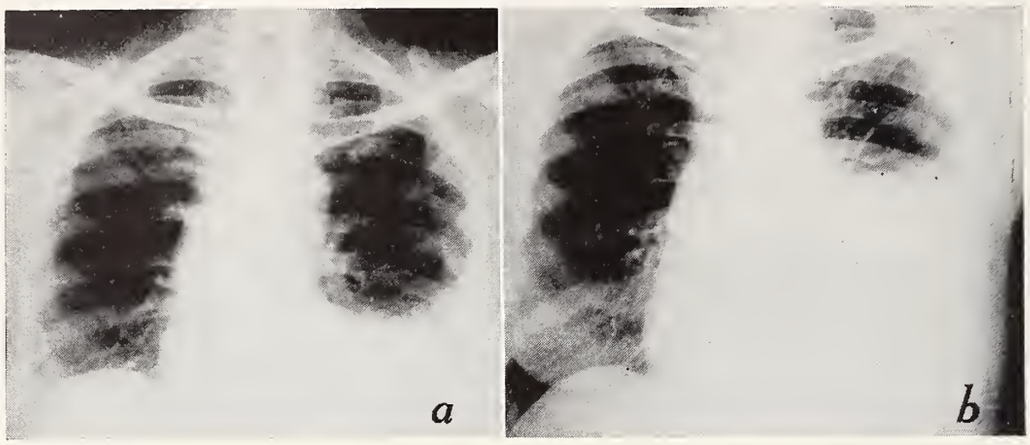


Fig. 3, *A*.—Hemothorax from rupture of intercostal artery due to fractured ribs. The blood, free in the pleural cavity, takes on the characteristic appearance of ordinary pleural effusion.
B.—Same patient a month and a half later showing considerable increase in amount of fluid. Blood does not clot as readily in the pleural cavity and bleeding may continue for long periods. Fluid blood has been aspirated from the chest three months after injury. Temperature reaction from foreign proteid absorption may erroneously suggest the development of empyema.

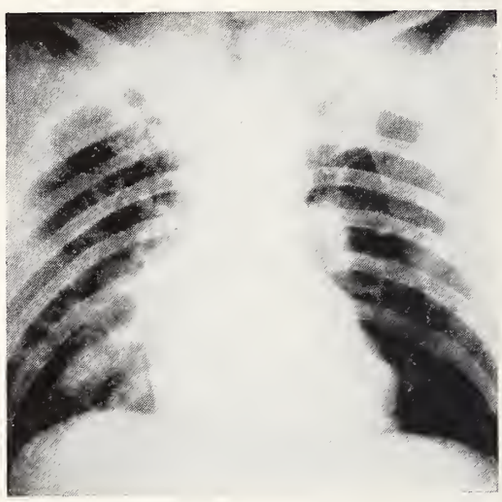


Fig. 4. Mottling of lung field indicating interstitial pulmonary hemorrhage. Patient fell flat on his back without sustaining fractured ribs or other injuries to chest wall. Patient expectorated blood; bloody expectoration is a common accompaniment of interstitial hemorrhage. Examination was made immediately after injury.

One of the most dreaded complications after a penetrating wound of the chest is infection. That the temperature reaction is not a reliable guide where large amounts of blood are in the chest is evident from patients whom we observed for days with temperatures running as high as 103.5, in which cultures of the aspirated blood were sterile and the patients ultimately recovered after simple aspiration. Such actions must be attributed to absorption of foreign proteid, incident to blood disintegration. After blood remains for a considerable time in the chest, it undergoes chemical change and is absorbed only very slowly by the pleural surface. Often aspiration is necessary for ultimate recovery. That infection of a hemothorax is a relatively rare condition is indicated by the fact that in 174 penetrating wounds of the chest in our series, only 3 developed empyema.



Fig. 5. *A*.—Delayed interstitial pulmonary hemorrhage from fracture of the ribs as the result of a fall. Examination after injury showed some separation of the fragments but little evidence of injury to the underlying lung.
B.—Further examination a short time later revealed hemorrhage into the lung structures.

Injuries to the Lung

Interstitial Pulmonary Hemorrhage.—Crushing injuries of the chest with multiple fractures of the ribs often result in serious damage to the underlying lung. Penetrating wounds of the chest are likewise very apt to cause injury to the lung with hemorrhage into its interstitial tissue. It is possible, however, to have hemorrhage into lung tissue from a blow on the chest without a mark being left on the chest wall (Fig. 4). Clinically, there is dyspnea from loss of air space, a sense of oppression and pain in the chest, and the coughing up of blood is usually a most prominent symptom of this condition. Roentgenographically interstitial hemorrhage into the lung is manifested by blotchy irregular areas of increased density throughout the lung field, which are usually evident immediately after injury. Such a lung injury is in itself serious, from the standpoint of the extent of damage to the lung and the amount of hemorrhage rather than the possibility of subsequent infection. The failure of the blood to clot as readily in the pleural cavity as elsewhere may result in slow continuous bleeding for days. In view of this possibility, the clinician should never permit a single negative roentgenogram taken immediately after injury to develop in him a feeling of false security. Subsequent roentgenographic examinations may show a continually increasing extent of bleeding in the lung (Fig. 5*A* and *B*). Moderate collections of blood may be completely absorbed from the pleural cavity but large quantities, especially after chemical changes have occurred, are absorbed very slowly and should be removed. In our experience abscess of the lung does not occur from injuries to the lung unless the infection is introduced from the outside by a penetrating wound of the chest. Even under these circumstances infection of the lung or pleural cavity, even following penetrating wounds is extremely rare. The ultimate prognosis seems to depend in great part on the amount of lung damage and extent of the hemorrhage. In simple penetrating

wounds of the lung the percentage of fatalities is small, one to two per cent, whereas in crushing wounds it is fully thirty-three per cent.

Traumatic Pneumothorax.—Injury to the chest wall, with or even without fracture of the ribs, itself. The picture is quite characteristic and can hardly be mistaken for anything else. If there is associated effusion, this takes on a straight line fluid level. Simple penetrating wounds of this sort, even if they produce pneumothorax, are

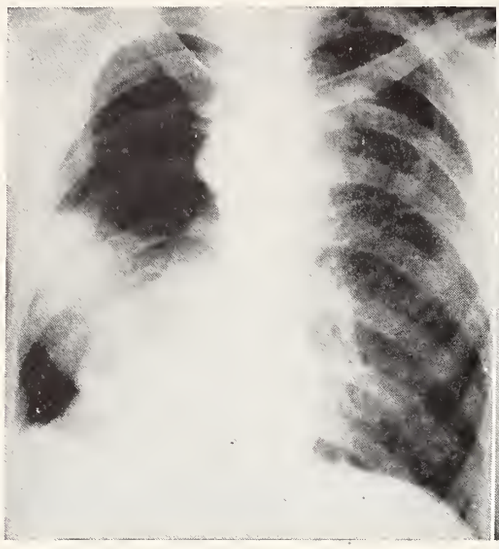


Fig. 6. Bilateral pneumothorax from fractured ribs as a result of an automobile passing over the body. Complete collapse of the left lung and partial collapse of the right. About one week later he coughed up a blood clot and from then on the left lung rapidly expanded.

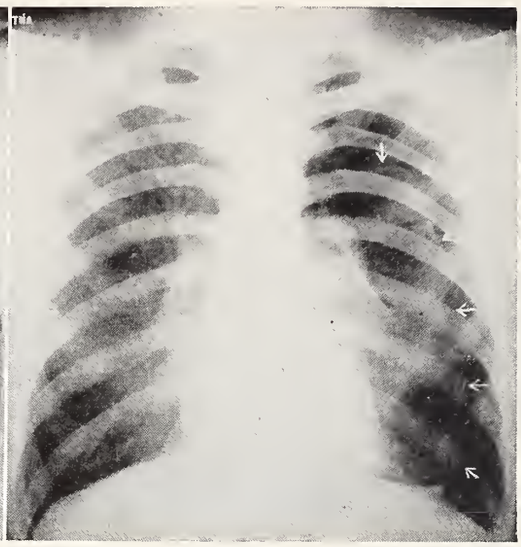


Fig. 7. Traumatic pneumothorax from penetrating wound of the chest. Note collapse of the lung without evidence of hemorrhage into lung structures or pleural cavity.

may result in pneumothorax with collapse of the lung (Fig 6). Strangely enough, the lung may receive extensive injury with interstitial hemorrhage, without development of pneumothorax; whereas pneumothorax may occur as a result of trauma to the chest wall without fracture of the ribs or evidence of external injury. We have encountered cases of pneumothorax where an automobile tire had passed over the chest without fracturing the ribs or leaving a mark on the chest. Pneumothorax quite consistently results from diving or falling into the water from great heights, where the individual strikes the surface of the water flat on his chest. Under such circumstances the ribs are not fractured but the skin shows extensive ecchimoses over the entire area. By far the most common causes of pneumothorax, however, are penetrating wounds of the chest, of which stab wounds and gunshot wounds are the best examples (Fig. 7). Stab wounds are most likely to produce pneumothorax but it is remarkable how often even such wounds fail to produce any evidence of this condition.

Roentgenographically pneumothorax is recognized (1) by a clear peripheral zone rendered free of lung markings by collapse of the lung and (2) by the clearly outlined margin of the lung rarely of serious consequence. If there is a large amount of associated hemothorax, however, beware of injury to the subdiaphragmatic organs, especially to the liver. Such injuries may result in death fully two weeks later from liver damage.

Massive (Atelectatic) Collapse of the Lung.—Another very interesting condition which sometimes follows trauma to the chest or other portions of the body is massive idiopathic atelectasis (Fig. 8). This is a condition first described by W. Pasteur, in association with diphtheritic paralysis of the diaphragm and later shown by the same author, to follow severe injury to the body or operative procedure. Sir John Rose Bradford, again called attention to the condition in association with severe wounds received by soldiers in the First World War. Massive (atelectatic) collapse of the lung has been well described by him as, "a condition, in which the lung, previously well aerated, suddenly, without apparent cause such as bronchial occlusion or pleural effusion, loses its air content and collapses."

The mechanism by which this is brought about is still not entirely understood. For some unknown reason there seems to be some inhibition

of the cough reflex which permits the accumulation of mucus in the larger bronchi causing obstruction. The entrapped air soon becomes absorbed by the circulating blood and the lung becomes atelectatic. The absorption of air in the collapsed lung is a natural sequence of bronchial obstruction; the condition which causes inhibition of the cough reflex permitting the collection of mucus in the bronchus still remains the mystery in the development of massive atelectasis.

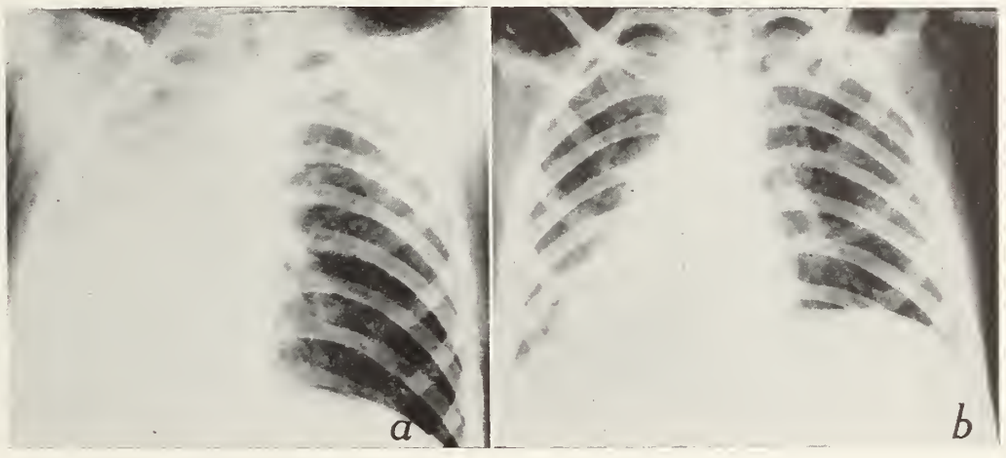


Fig. 8. *A*.—Massive (atelectatic) collapse of the lung following seven days after injury to spleen from an automobile accident.
B.—Complete reinflation after rolling patient upon the involved side and causing him to cough. This dislodges the plug of inspicated mucus and permits free entrance of air resulting in immediate reinflation of the lung under direct fluoroscopic vision.

Clinically the condition manifests itself in two forms, one in which the respiratory symptoms predominate and the other in which the respiratory symptoms are masked by severe pain elsewhere in the body. In any event, the respirations are rapid and there is fixation of the affected side of the chest and immobilization of the diaphragm. The affected lung is dense and airless giving the physical findings of consolidation. Blowing breathing is heard over the involved side due to transmission from the larger bronchial branches through the consolidated lung. The body temperature is elevated often as high as 103.5 and the pulse rate becomes rapid. There may even be a definite leukocytosis. So far the clinical picture is that of pneumonia, and there can be no doubt but that many of these cases have been diagnosed as pneumonia in former days. Certain other distinctive features are present, however, which indicate the true nature of the disease. In lobar pneumonia the volume of the lung remains the same, the air spaces are merely filled with exudate; in massive atelectasis there is a shrinkage of the lung volume due to absorption of the air. Since there is no associated pneumothorax, the lung still remains closely adherent to the parietal chest wall, and the contracting lung exerts traction on the chest wall drawing it inward. This force is also exerted upon the mediastinum and all of its structures and upon the diaphragm. One of the most striking clinical features is the extreme displacement of the apex beat of the heart by traction from the shrinking lung.

All of these features are reflected in the roentgenogram; the lung on the involved side becomes dense and airless often fully as dense in appearance as the consolidation of labor pneumonia; there is narrowing of the affected side of the chest and closer approximation of the ribs, the heart and mediastinal structures are displaced toward the involved side and there is elevation and fixation of the diaphragm.

A number of years ago we were able to demonstrate that, merely by rolling such a patient upward upon the uninvolved side of the chest and causing him to cough, the obstructing mucus could usually be dislodged, resulting in immediate reinflation of the lung.[4,5] In our experience this has always been successful where the obstruction was due to mucus. It may be relied upon to cause reinflation unless there is some developmental anomaly of the bronchus or some organic bronchial occlusion such as bronchiogenic carcinoma. Bronchoscopy is not necessary or desirable unless this method has been tried and failed. Where this occurs, you may be sure that some other organic lesion is the cause of the bronchial obstruction, not merely the ordinary post-traumatic type of idiopathic atelectasis.

Injuries to the mediastinum from external

trauma are rather rare. They are confined almost entirely to penetrating wounds, especially gunshot wounds which traverse the chest from side to side. In our experience wounds of the mediastinum such as this contributed largely to the fatal cases of gunshot wounds of the chest.

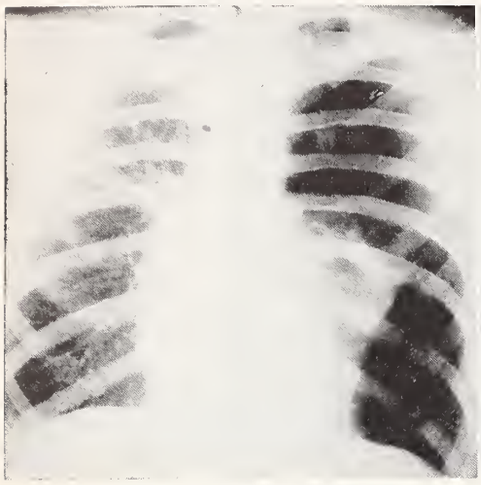


Fig. 9. Progressive spontaneous pneumothorax following exertion showing almost complete collapse of the lung. Process of collapse was slow but continuous requiring more than an hour to become complete. Spontaneous pneumothorax is usually due to rupture of an emphysematous bleb.

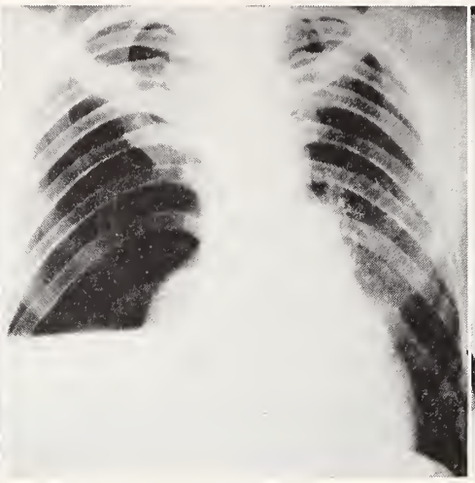


Fig. 10. Spontaneous hemopneumothorax with complete collapse of the lung. Hemorrhage is a very unusual complication of spontaneous pneumothorax. Three days after this examination about 2 a.m. before he could receive medical attention he suddenly became extremely dyspneic and cyanotic and died. On opening the chest at autopsy large amounts of air under great pressure escaped from the pleural cavity. There was no evidence of fresh bleeding and diligent search failed to reveal either point of bleeding or the point from which pressure pneumothorax originated. Death was probably due to acute pressure on the great vessels.

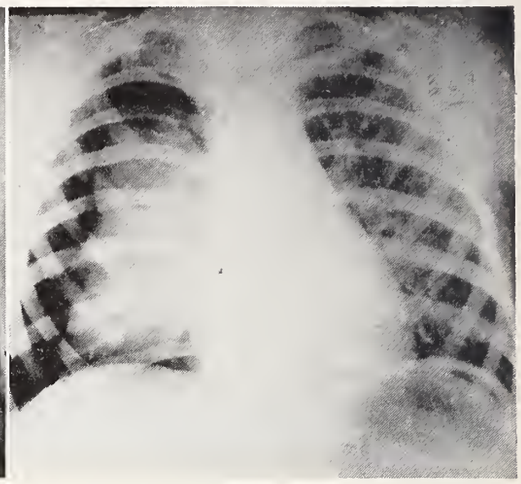


Fig. 11. Pneumothorax and atelectasis following injury to the lung from removal of a cylindrical glass bead from the right main stem bronchus. A sharp broken corner of the bead caused laceration of the lung during bronchoscopic removal. Note the consolidated collapsed lung from atelectasis and the free air in the pleural cavity.

Diaphragmatic damage usually results either from severe crushing injuries to the chest in which the abdomen is compressed or from lacerations or stab wounds involving the diaphragm. Such injuries may not be apparent immediately after trauma but may develop suddenly even weeks later on slight exertion which may even be fatal.

Effects of Internal Injury

The respiratory organs may also be subjected to trauma from within.

B. Effects of Internal Injury (Trauma from Within).
   1. Changes in Intrathoracic Pressure;
      (a) Spontaneous Pneumothorax,
      (b) Mediastinal Emphysema.
   2. Aspiration of Foreign Bodies—Laceration of Lung Structures.
   3. Instrumentation—Bronchoscopy.

Effects of Internal Injury—Changes in Intrathoracic Pressure

Spontaneous Pneumothorax.—Next we come to a group in which there is no external injury but in which trauma is exerted from within. These are fewer in number and more limited in scope. Most common in this group are the conditions which result from changes in intrathoracic pressure due to exertion. Heavy lifting or other muscular exertion may cause rupture of the lung with spontaneous pneumothorax and pulmonary collapse (Fig. 9). At times this may follow apparently trivial exertion; it is usually accompanied by sudden sharp pain in the chest and shoulder, running down the arm, and there may be dyspnea depending upon the degree of collapse of the lung. Spontaneous pneumothorax of this sort usually results from rupture of a pleural bleb. Ordinarily absorption of the air occurs within a few weeks and normal function is reestablished. Occasionally, however, even several days after the original collapse, a double check valve may develop at the point of pleural injury, resulting in pumping air into the pleural cavity under great pressure. The pressure pneumothorax thus developed may become so great that death results from pressure on the great vessels.

Roentgenographically the pneumothorax thus produced does not differ in any way from any other pneumothorax; the peripheral zone of the chest is devoid of lung markings and the edge of the lung can be plainly visualized. The develop-

ment of pressure pneumothorax is evident in the roentgenogram by the extreme displacement of the heart and mediastinal structures to the opposite side due to excessive air pressure in the pleural cavity. Hemorrhage is very rarely associated with spontaneous pneumothorax. It usually means very extensive injury to the lung and may be fatal (Fig. 10).

Mediastinal Emphysema.—Occasionally rupture of the lung into the interstitial tissue may result in interstitial pulmonary and mediastinal emphysema. This is an extremely rare condition. It usually causes little trouble and the air is rapidly absorbed. It manifests itself roentgenographically by the appearance of air in the mediastinum, forming a halo about the cardiac shadow at times extending into the neck.

Aspiration of Foreign Bodies—Bronchoscopy.—Foreign bodies, aspirated into the respiratory tract, may puncture the lung, resulting in pneumothorax; or injury may be done in bronchoscopic attempts at removal (Fig. 11). Such injuries may prove serious and death may ensue. Injury from instrumentation is very rare owing to the skill of the modern bronchoscopists. Cases of this sort are not so much the concern of clinicians or general surgeons, however.

Influence of Trauma on Production of Bacterial Diseases of the Lung

C. Influence of Trauma in Producing Bacterial Diseases of the Lung.
1. Traumatic Pneumonia,
2. Pulmonary Tuberculosis.

Traumatic Pneumonia.—Roentgen examination would seem to indicate that this condition occurs much less frequently than is generally supposed. A careful distinction must be drawn between actual pneumonia caused by infection and interstitial hemorrhage due to trauma. Others feel that this condition seen after trauma constitutes a true pneumonic infection.[1,8] In the roentgenological service of the St. Louis City Hospital over a ten-year period in which a great number of chest injuries occur, less than half a dozen cases have been noted in which a definite relationship could be established between trauma to the chest wall without fracture of a rib or hemorrhage into the lung or pleura, and subsequent pneumonia.[6]

When pneumonia does follow trauma to the chest, it comes on from one to seven days after injury. It resembles lobar pneumonia in every respect both clinically and roentgenographically, with high fever, rapid pulse, and leukocytosis; showing roentgenographically dense consolidation closely limited to one or more lobes. Under such circumstances it is logical to suppose that, if trauma had anything whatever to do with the pneumonic process it must have been due to a lowering of bodily resisting power, permitting infection which already existed to produce disease.

Pulmonary Tuberculosis.—In the relationship of pulmonary tuberculosis and trauma a similar statement can be made. In a survey made a number of years ago of 500 consecutive patients admitted to Koch Hospital for pulmonary tuberculosis, only thirty-two instances were found in which there was any history of associated trauma. In more than 50 per cent of these the injury was to an extremity or remote portion of the body; the time elapsing between injury and subsequent diagnosis of tuberculosis varied from one week to eighteen years; in no instance was the patient known to be free from tuberculosis before the injury. No evidence was obtained to indicate that trauma played any definite part in the development of pulmonary tuberculosis in an individual previously free of the disease. In an individual in whom pulmonary tuberculosis already existed, it would seem possible that trauma to the chest sufficiently severe to produce injury to the lung might cause a breaking down of bodily resistance against the disease and thereby permit the spread of the infection.[7]

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THE POSTPARTUM HANDLING OF LATE TOXEMIA OF PREGNANCY*

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HYPERTENSIVE toxemia of late pregnancy will be designated as toxemia throughout this discussion in order to avoid needless repetition of an awkward term and inasmuch as none of the other toxemias of pregnancy will be considered.

Paradoxical as it may at first appear, it is through postpartum examinations of the toxemic patient that toxemia may be prevented. Although the etiology of toxemia is a problem which remains unsolved, three widely accepted concepts pertaining to the subject are:

1. That toxemia emanates from more than one source—an idea which has led to classifications none of which are adequate.
2. That the identification of the source of a *particular* toxemia at the time of its existence is possible only within certain limits.
3. That *some* of the toxemias have a common factor with the persistent sequelæ of toxemia, this common factor being the process or processes initiating vascular hypertension.

Contrary to older opinion which considered toxemia to be essentially free from persistent effects, from one-third to one-half of all women who suffer from toxemias, according to the observations of numerous more recent investigators,[1, 2, 4, 5, 7, 11] are left with residual symptoms. Unfortunately, also, an older terminology has been retained which implies that pathological processes distributed generally throughout the body are confined to the kidney. Thus we find in the most recent classification of the toxemias, that of the American Committee on Maternal Welfare, the condition "chronic vascular nephritis," or "nephrosclerosis" listed under renal disease. While it may be admitted that the kidney is peculiarly susceptible to the localization and the progression of the process, an underlying pathology has been established as involving in various degrees the entire arteriolar system—namely arteriolosclerosis. "Arteriolosclerotic toxemia," the term used by McKelvey, would therefore seem to be more descriptive. Also, it suggests a concept which leads naturally to a wider consideration of the vascular system in relation to the toxemias. Considering that in the population approximately 40 per cent of women are potentially hypertensive, the postulation seems reasonable that a fair number of the toxemias originate in a deficient vascular system rather than in the products of conception. The duration of a toxemia also becomes more significant. Recently Chesley and his coworkers have shown that in the 53 per cent of 466 women who had hypertension after five years or more following nonconvulsive toxemia, approximately 80 per cent had had a duration of the toxemia for only three weeks. From their studies they estimate that prompt delivery of the toxemic patient whose disease appeared in the last trimester of pregnancy would have lowered the incidence of residual hypertension from 53 per cent to 13 per cent. Serious consideration, therefore, must be accorded to the length of time a toxemia may be allowed to continue, particularly in view of the uncertainty in differentiating the late toxemias at the time of their existence.

The etiology of arteriolosclerosis is unknown except for the relationship to family history. A description of the pathology would serve no purpose here, except to state that the process begins with spasm of the arterioles which, after varying periods of time, results in a permanent and progressive proliferation of the intimal walls and sclerosis of the media. The effect of the lesion is constriction of the lumen of the smaller arterioles, which produces an increase in vascular field resistance. A consequent increase in blood pressure is needed to overcome this resistance. As Bell has pointed out, arteriolosclerosis has nothing in common with arterio- or atherosclerosis.

The clinical picture of arteriolosclerosis resulting from toxemia differs in no way from that of the mild, severe, or malignant essential hypertension as found in the male or the nulliparous female. Variations as to the degree of intensity, rapidity of progression, presence or absence of albuminuria, and terminal effect are the same. It is known that arteriolosclerotic hypertension

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when once established does not recede, and may progress with varying speeds to three terminations—renal, cardiac, or cerebral, and, as such, this disease is a major medical problem.

What is of first importance to the obstetrician, however, is the effect of pregnancy on the progress of an established arteriolosclerosis. In other words—what are the remote effects of residual toxemic arteriolosclerosis? Among the first of the statistical studies pertaining to the subject which are becoming increasingly available, are those of Peckham and Stander from the Johns Hopkins Hospital. These show that the ten-year death rate of patients with hypertension following toxemia is 25 per cent, as compared to an expected mortality of 7.5 per cent in the Standard Insurance Mortality Tables for women of the same age. This then would represent a death rate of 17.5 per cent due to toxemic sequelæ. If one or more pregnancies, however, had been undergone by women in this hypertensive group, the mortality rate increased to 47 per cent, representing then a 40 per cent death rate due to pregnancy superimposed on toxemic residual hypertension. Figures now in preparation at the University of Minnesota Hospitals, by Haugen, indicate essentially the same results—allowances being made for racial differences.

Chesley and his co-workers in their recent study also show clearly the effect of subsequent pregnancies on the incidence of hypertension in a group of living women five years or more after nonconvulsive toxemia.

Pregnancies Subsequent to Toxemia	Percentage Followed by Hypertension
None	44.7
One	
Normal	11.7
Toxemic	64.6
Two	
Normal	8.0
One toxemic; one normal	50.0
Both toxemic	80.0

The fruitfulness of the subsequent pregnancies was also striking. In 200 post-toxemic patients with 247 pregnancies the maternity mortality was 2 per cent. In 203 pregnancies progressed as far as twenty-four weeks 90 (45.8 per cent) were toxemic and 108 (53.2 per cent) were nontoxemic. Two hundred forty-seven pregnancies resulted in 190 (77 per cent) live births, 44 (18 per cent) in abortions and 13 (5 per cent) in stillbirths. Their data further show that the interval between the toxemic pregnancy and the subsequent pregnancy has no bearing on the recurrence of toxemia or the establishment of hypertension.

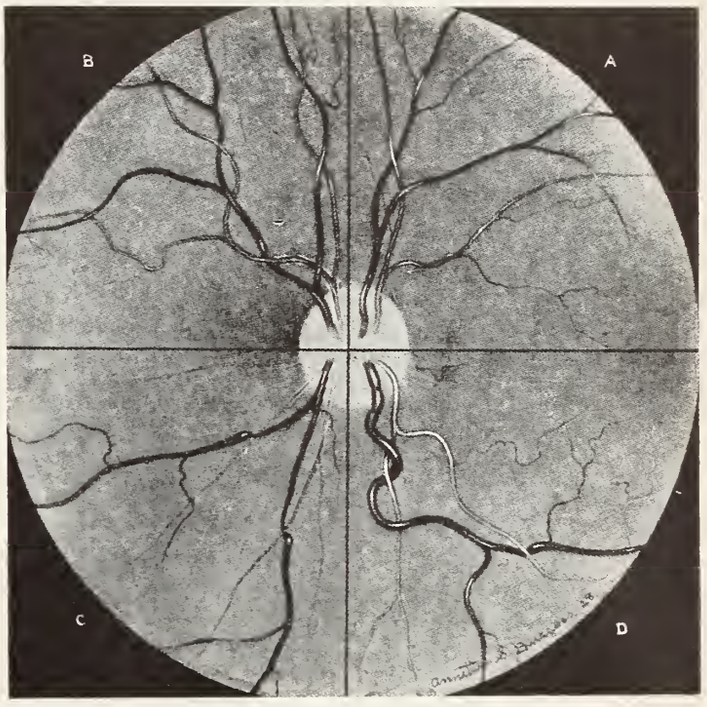


Fig. 1. Composite drawing illustrating various types of retinal vascular lesions. (From Friedenwald.)

A. Normal eye-grounds.
B. Senile arteriosclerosis without hypertension.
General caliber of arteries normal; arterioles no lesion.
Moderate arteriovenous pressure.
Larger arterial branches show leading and visibility of walls.
C. Arteriosclerosis with hypertension.
General reduction in caliber of whole arterial tree.
Arteries straight, branch at acute angles.
Increased visibility of artery walls, disappearance of reflex stripe, leading present.
Marked arteriovenous pressure.
D. Arteriolosclerosis.
Larger arteries full and tortuous, coppery in appearance, widened reflex stripe.
Moderate arteriovenous pressure.
Smaller arteries branch at right angles.
Terminal arteries irregular tortuosity, visible walls, silver wire change.

This, then, is a part of the sordid picture of the remote effects of toxemia. Does importance of postpartum examination need more emphasis?

All hypertension must not be considered as arteriolosclerotic in origin and this discussion implies that other causes than arteriolosclerosis are absent. Inasmuch as the diagnosis of hypertension is dependent on the blood pressure determinations, a few elemental considerations may be permitted. General opinion has set the

limits of systolic and diastolic readings for hypertension at 140 and 90 respectively, with the diastolic level being taken at the change of note. Authoritative opinion also attaches greater significance to the diastolic level of blood pressure, it being postulated that an elevation of the diastolic pressure is equivalent to twice that elevation of the systolic pressure. Hypertension is considered permanently established if present six weeks after the end of pregnancy, and its absence after this time must be proved by careful and repeated examinations. Albuminuria is generally not present and kidney functional tests usually are normal. Albuminuria when present, disturbed kidney function, and cardiac hypertrophy are manifestations of more advanced arteriolosclerosis.

Another method of study to establish the diagnosis of arteriolosclerosis is through the use of the ophthalmoscope. Although ophthalmoscopy offers no technical difficulty, proper interpretation requires considerable experience and practice. However, every practitioner of obstetrics should be sufficiently familiar with the eye ground examination to appreciate the help of the well-trained ophthalmoscopist. The accompanying diagram of Friedenwald has been found to be most helpful.*

The cold pressor test of Brown is considered by some as a valuable adjunct to the study of arteriolar disease. On the other hand, there are those who believe the test is more meaningful of pain tolerance. The test is easy and simple to do and its final value will be found in the results of its wider application. The technique as described by Hines, briefly is as follows: The patient is allowed from twenty to sixty minutes rest with the blood pressure cuff in position and a basal blood pressure reading is determined. The opposite hand is then immersed in ice water to a point just above the wrist. Blood pressure readings are then taken at the end of thirty and sixty seconds, the highest of the two readings being taken as an index of the response. The hand is removed from the ice water and another reading is taken at the end of two minutes, and thereafter every two minutes until the blood pressure returns to the basal level. In normal patients the blood pressure usually returns to the basal level within two minutes after the hand has been removed from the cold water. Hyper-reactive response is considered present if the systolic increase above the basal level is 25 millimeters or more, and if the diastolic is 15 millimeters or more—emphasis being placed on the diastolic level. If a maximal reading is above 145 systolic and 90 diastolic, the subject is considered to have a hyper-reactive vasoconstrictor mechanism—a reaction suggestive of arteriolosclerosis tendency.

*See preceding page.

Three conclusions would seem manifest:

1. Arteriolosclerosis is frequently caused by toxemia, the duration of which may be significant.

2. Arteriolosclerosis is considered established if hypertension is present six weeks after a toxemia.

3. With arteriolosclerosis established, serious consideration must be given to the prevention or interruption of subsequent pregnancies.

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THE CLINICAL RECOGNITION OF CORONARY DISEASE*

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THE clinical recognition of coronary disease must be prompt and accurate if its victims are to be given proper treatment and sound advice. The descriptive terminology used must be correctly chosen—first, to clarify the physician's thinking, and second, to present to others a true word picture of the condition present. The commonly used terms such as "angina pectoris," "coronary sclerosis," "coronary thrombosis," and "cardiac infarction" are not interchangeable. Each has its own place and correct usage, and must be so employed if one is to say what he means and mean what he says. In dealing with a problem of coronary disease, the habit of thinking it all the way through, in contrast to an immature decision unsupported by adequate investigation, will pay big dividends in a better quality of work and satisfaction that comes only from work well done. If one is to avoid the pitfalls in diagnosis that lurk in the problem of coronary disease, he must do some thinking in advance, develop a plan of action, and train himself in a routine of procedure.

A detailed and exact history is critically important, and must be followed by a thorough physical examination, which may show surprisingly little regarding the heart but must be done for the differential diagnosis. Laboratory procedures should include the hemoglobin estimation, leukocyte count, and sedimentation rate. An electrocardiographic record, and a six-foot chest x-ray are also essential. It is impossible to do careful, complete, and exact work in the diagnosis of coronary disease without the help of the electrocardiogram. In differential diagnosis one must use various types of laboratory and x-ray procedures as they are indicated in order to arrive at the correct diagnosis; otherwise, one would be guessing.

Three especially important phases of the problem of coronary disease have been selected for discussion from the standpoint of diagnosis. They are coronary sclerosis, cardiac infarction, and angina pectoris. Bell, in his latest textbook of pathology, states that coronary sclerosis consists of intimal atherosclerosis with calcification. The calcified, pipestem arteries often found in the very elderly, as a result of the aging process, do not produce important symptoms if the lumen of the vessels is not diminished. The ability of this coronary artery to dilate, however, is lost, so substernal discomfort and oppression can occur when unusual demands upon the heart call for more blood than the sclerosed vessels can supply. This situation probably occurs rarely in the very elderly because physical activities are reduced gradually over a period of time as age increases. The electrocardiographic record of these people may often be normal, or nearly so, or it may show bundle branch block, or changes in the conduction system within the musculature of the ventricles. These changes are usually associated with myocardial sclerosis and are not necessarily immediately dangerous.

The group showing intimal atherosclerosis with narrowing of the lumen is a greater problem. These changes occur at a much earlier age, usually in the late forties and fifties, and more often in men than in women. The intimal changes reduce the lumen of the vessel involved and materially diminish the volume of blood that can pass through. Varying degrees of anoxemia of the heart muscle results, depending upon the demand for blood at any given time. As this condition progresses the patient notices substernal distress in activities that formerly were done with ease. The distress comes commonly after meals, followed by exercise such as walking. It is produced or aggravated by walking against a cold wind, especially when carrying something. This peculiar distress is frequently associated with gas after meals, and belching often gives complete temporary relief. Recent work, in which small balloons were introduced into the lower esophagus and upper stomach and inflated, suggests that a vagal reflex from the upper portion of the gastro-intestinal tract may initiate and aggravate the symptoms of coronary sclerosis.

Patients with coronary atherosclerosis usually lose weight, the systolic blood pressure often drops steadily to 100 or below, and the sphere of

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their physical activities with comfort slowly but steadily narrows. Unless there has been a preceding hypertension with a resulting dilatation and hypertrophy, these patients do not show appreciable cardiac enlargement. Some recent publications claim that coronary atherosclerosis alone is responsible for decisive cardiac enlargement on the basis of hypertrophy. This is not proved so as to be accepted. The electrocardiogram may show little except T-wave flattening, or inversion in the first lead, or the first and second leads, indicating left ventricular muscle damage. If there has been a preceding hypertension, the electrocardiogram will show left axis deviation and chronic left ventricular strain. This pattern as described by Barnes consists of a definite depression of the S-T segment in the first and second leads in addition to the T-wave inversion. Auscultation frequently reveals nothing. The blood and urine may also be normal, except for a moderate anemia. As the vascular condition progresses, an important and ominous development is left ventricular failure. This is evidenced by attacks of nocturnal dyspnea (cardiac asthma) in which one or more times a night the patient is suddenly awakened from sleep with a sense of suffocation, shortness of breath, and tachycardia that compels him to quickly assume the upright position in bed or out of bed. The history of substernal distress on effort, the electrocardiographic record, the gradual fall in blood pressure, the weight loss, and the absence of hypertrophy, unless there has been a preceding hypertension, and symptoms of left ventricular failure should enable one to make the diagnosis of coronary atherosclerosis.

Cardiac infarction commands interest and attention because of its prevalence, its dramatic occurrence, and its tragic possibilities. Failure to diagnose this condition when it is present can be fatal to the patient. To say it is present when it is not is cruel and unfair. Errors result from not using the electrocardiogram, placing too much reliance on history alone, and neglecting a thorough investigation. A more regrettable type of error is misinterpreting the electrocardiographic pattern of chronic left ventricular strain as being that of anterior infarction, the Q_1 T_1 pattern described by Barnes. In this instance cardiac infarction is said to be present where it does not exist and the patient is subjected unnecessarily to a strict six months' régime. The Q_3 T_3 pattern shown by Barnes to be characteristic of posterior infarction is not recognized as commonly as it should be, so still more errors in diagnosis occur.

Cardiac infarction is a vascular accident usually based on some type of thrombus formation within the coronary vessels, occurring predominately in male patients over forty years of age. It is now being frequently found in patients under forty years. Coronary atherosclerosis is its commonest precursor, but in the earlier ages intimal or subintimal changes occur, which by contiguity are responsible for the thrombus formation on the intimal lining of the coronary artery. These intimal or subintimal changes occur in association with potent sources of infection (coronary arteritis), hemorrhages as the result of chest injuries, or unusual strenuous physical exertion. Paterson of Ottowa thinks intimal capillary hemorrhages are caused by capillary fragility associated with persistant or transitory hypertension, or from vitamin C deficiency. When the coronary thrombus, whatever its cause, suddenly occludes a sufficiently large vessel, cardiac infarction occurs. Thrombosis precedes infarction by minutes, hours, or days—a very important legal point. Coronary thrombosis in itself may or may not produce important symptoms depending entirely upon its rate of formation, the size of the vessel involved, and whether or not there is sufficient time for collateral circulation to develop. Under certain conditions cardiac infarction can occur without thrombosis.

In the typical case a sudden, severe pain occurs beneath the lower third of the sternum causing the patient to become profoundly weak, ashen gray and break out in a cold sweat. The pain may be referred to the left upper anterior chest, the left shoulder and down the left arm to the wrist, or to the upper abdomen. The pain is not steady, but is paroxysmal in character and progressive in severity, usually reaching a maximum by a step-like process in two or three hours, when it gradually subsides to recur off and on with decreasing severity for the next two to five days. The blood pressure usually falls sharply, but occasionally is elevated. Vomiting may occur. Unfortunately all cases are not typical, for example those occurring without pain. Whenever one suspects cardiac infarction, it is wiser to assume its presence until a definite diagnosis is established. A routine procedure that

can be recommended when infarction is suspected is as follows: Keep the patient in bed at absolute rest; take the temperature every four hours; get a daily leukocyte count and sedimentation rate for five days; have an electrocardiographic record made at once and repeat every 48 hours. This will bring out the usual small temperature rise of not over 100 degrees, the leukocytosis of from 10,000 to 20,000, and the sharp rise in the sedimentation rate of between 40 and 100 mms. in one hour, together with the characteristic progressive changes in the serial electrocardiograms. If this method is followed, the chance of overlooking cardiac infarction is very small.

In differential diagnosis, pericarditis, gall-bladder disease, perforation of an abdominal viscus, cardiospasm, pulmonary infarction, and massive collapse of the lung, must and can be ruled out if they are kept in mind.

Angina pectoris is the stumbling block of diagnosis and the catch-all for anterior chest pain in men over forty years of age. Every left anterior chest pain is not angina pectoris. Spondilitis, myositis, pleurisy, herpes zoster, hysteria, focal infection, and other conditions can cause anterior chest pain. It has been said, "The farther the pain is away from the mid-sternal line, the less likely is the cause to be in the heart." Angina pectoris is a symptom complex so definite that it can be considered almost a disease entity. Levine says, "A patient either has it or he does not have it." All qualifying terms of severity that can be used in relation to angina pectoris serve to increase the confusion of the situation rather than to clarify it. White in his textbook, "Heart Disease," defines it as "A paroxysmal sensation of oppression in the thorax, usually under the upper or middle sternum, brought on by exercise or excitement, persisting for a few minutes, and frequently radiating to the arms." Many observers believe there is a definite emotional element to angina pectoris associated with angiospasm and anoxemia in contrast to the discomfort resulting from the temporary, insufficient blood supply in response to effort found in coronary atherosclerosis. The attacks of angina pectoris are characteristically unpredictable —a situation that provokes an attack today will not produce one next week. There is no single, generally accepted explanation of the trigger mechanism that produces the attack, but it is intimately and regularly associated with heart muscle anoxemia. Some contend the emotional production of adrenalin is the exciting factor, and cite as proof the relief following x-ray therapy over the adrenals. While 95 per cent of the cases of angina pectoris show disease of the coronary arteries or their ostia in the aorta, at least 20 per cent exhibiting these same changes do not have the symptom complex of angina pectoris. Angina pectoris actually is a functional state, because there are no organic changes characteristic of it.

The diagnosis is made on the characteristic clinical symptom complex of paroxysmal, unpredictable substernal pain, sometimes radiating to the arms, lasting only a few minutes, but so severe that it causes its victim to stop in his tracks, scarcely daring to breathe or move a muscle, in association with emotion, excitement, or physical effort. In many instances it produces the ghastly feeling of dissolution and impending death. There should be no difficulty in recognizing it or differentiating it from its imitators, when the term angina pectoris is properly used in the light of our present knowledge of coronary artery and heart disease. If we are not willing to reserve the term angina pectoris for this small group showing this typical symptom complex in relation to emotion and excitement, as well as effort, irrespective of the presence or absence of associated coronary pathology, then the term had better be discarded entirely just as we discarded the term "Bright's disease" for nephritis, as the various individual types of nephritis became recognized and Bright's disease was separated into its component parts. Because of the universal dread and hopelessness associated with the term angina pectoris in the minds of the laity and the promiscuousness and carelessness with which the term is frequently used by the profession, it is necessary to use the greatest exactness and care in the use of the term or to discard it entirely.

In conclusion, the following points can well be emphasized:

1. The three important phases of the problem of coronary disease, i.e., coronary atherosclerosis, cardiac infarction, and angina pectoris, have characteristic symptoms or findings, or both, that differentiate them from each other and from the conditions which simulate them.

2. Exact diagnosis in coronary disease is not consistently possible without the free use of the electrocardiogram correctly interpreted.

3. The descriptive terms used in coronary disease are not interchangeable.

4. The daily leukocyte count and sedimentation rate, the four-hour temperature determinations for five days, together with forty-eight hour serial electrocardiograms, is a strongly recommended procedure in the diagnosis of cardiac infarction.

5. When one suspects the possibility of a cardiac infarction, treat the patient as such until it has been proved not to be present.

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THE ROLE OF DRUGS IN THE CLINICAL MANAGEMENT OF CORONARY DISEASE*

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THE clinical management of coronary disease may be classified as: hygienic, medicinal, surgical and roentgenological. Only drug therapy is under consideration in this paper, but undue emphasis on medicinal management is not intended. Many patients having coronary disease may be treated through the entire course of their disease with the use of little or no medicine.

At the present time the physician is handicapped in treating coronary disease because the functional disturbance is neither satisfactorily nor completely explained by any theory. The symptoms of coronary disease are generally considered as due to a decrease in the flow of blood through the coronary arteries, caused by structural changes or spasm in these arteries. Except in syphilis, no drug now known has the power to alter already existing structural changes in the coronary vessels.[20] The use of drugs, then, must be limited to those designed to control the symptoms of the disease and to prevent complications. Some drugs are thought to accomplish this by actually dilating the coronary vessels. Of these, the nitrites and xanthine compounds are commonly used.

The nitrites are vasodilators of all peripheral arterioles, both systemic and coronary. The dilation of the systemic arterioles results in a readjustment of the circulation, providing a more favorable relationship between cardiac work and coronary blood flow, while the action on the coronary vessels increases coronary blood flow and lessens myocardial anoxemia. Essex, measuring the coronary blood flow by means of a stromuhr in trained dogs, found the nitrites to increase coronary blood flow from 100 to 300 per cent.[9] Clinical observers and other animal investigators are in fair agreement.[19,21,25,30]

The action of nitrites is of short duration, two to seven minutes,[9] and in other than those suffering from angina of effort, such short effect is not sufficient to be helpful. They have no direct action on pain, and are not indicated in cases of thrombosis. They are not habit forming, and tolerance for them does not develop.[20] They are most effectively used at the earliest indication of an attack, rather than after the pain is well established.

The xanthine preparations, compounds of theocalcin, theobromine, and theophylline, have long been more or less accepted as potent dilators of the coronary arteries. The reports of investigators, both clinical and those using animal experimental methods, were, until quite recently, almost uniformly favorable.[14,15] In recent years, however, although many papers still report favorable results from their use in coronary disease, and on their effect on the coronary blood flow

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in animals, a number of paper have appeared that report the opposite results.[6,7,9,10,11,16,17,18,20,21,23,25,27,28,30] Gold and his co-workers recently reported the result of a clinical study based on the observation of the effect of theophylline ethylenediamine (aminophylline) on a hundred well controlled cases and reported this compound to have no appreciable effect on the disease that was not equally obtained when placebos were administered.[18] On animals, Essex, Wegria, Herrick, Mann, Green and others have reported actual coronary dilation from the use of xanthines.[10,14,21,22] Smith reported that after ligation of the coronary arteries in dogs, the administration of xanthines lessened the size of the resulting infarct and hastened its healing.[13] Gold, in similar circumstances, found no effect.[17] Davis and the author, experimenting on dogs, and using the hot wire anemometer method as devised by Anrep, were unable to obtain any appreciable increase in coronary flow from the injection of theophylline ethylenediamine.[7]

The value of the xanthines has probably been overemphasized, but the conclusion that they have no value in coronary disease is not justified. They are diuretics, and they possibly have some effect on circulation other than that on the coronary vessels. This last needs further study.

In the care of patients with coronary disease one of the main objects is to avoid nerve tension and strain during the day and to make certain of satisfactory sleep at night. Such conditions may exist naturally, or they may have to be assured by medication. The sedatives as a group, are useful to this end. The most popular sedatives are the members of the barbital family, although others such as bromides and chloral are used. These compounds vary in potency, and the susceptibility of patients differ, so that dosages must be adjusted according to the individual's response. The quality of rapidity of action and recovery possessed by some barbiturates has no particular advantage in the treatment of coronary disease, as a more or less persistent mild depression is desirable.

The opium derivatives, such as morphine and pantopon, find their use in the treatment of coronary disease in those cases in which the vasodilators and sedatives will not sufficiently control pain, as in occlusion. In the angina of effort morphine should not be used, as in these cases the paroxysmal spasms may be frequent enough to result in habituation. The dosage of morphine to be given, when needed, should be large enough to control both the anxiety state and, when possible, the pain. Extremely large initial doses of morphine are not necessary or desirable. A quarter grain dose may not be sufficient, but it may be repeated at intervals until the desired effect is obtained.

The use of digitalis in coronary artery disease has received much attention. The experimental and clinical literature is inconclusive, some report vasoconstriction, others vasodilation, and others no effect. An investigation on this subject made by Davis and myself on dogs, showed that digitalis in the range of therapeutic doses had no effect on the coronary blood flow.[7] Digitalis did increase the strength of ventricular contraction sufficient in our opinion to make its use contraindicated in the case of coronary occlusion, until after such time as the infarct has had ample opportunity to heal. This stimulation of strength of ventricular contraction caused by the use of digitalis, might in some cases, induce cardiac rupture.[7] Gold, however, minimizes this danger.[20]

Clinically, Gold and his collaborators, in a study of one hundred twenty patients with coronary disease, came to the conclusion that it is unlikely that digitalis causes angina.[19] The presence of coronary disease, except occlusion, need not deter one from using digitalis when needed. When edema is present and in those suffering from attacks of paroxysmal dyspnea, the use of diuretics such as salyrgan or mercupurin in conjunction with digitalis may prove very helpful.

Except in syphilis, the use of the various iodides in the treatment of coronary disease is not supported by any experimental or clinical evidence.

Trichlorethylene has been reported to be of use in the relief of pain in coronary sclerosis and in the anginal syndrome.[26,32]

Oxygen has long been used in the relief of pain of coronary occlusion. Recently Boland claimed excellent results from its use in 100 per cent concentrations.[3,4,5,24,31]

Numerous tissue extracts have been reported by various investigators to be potent dilators of the coronary blood vessels, but at the present time this work has not been sufficient or well enough controlled to warrant their general use.[12,29]

Caffeine, coramine, metrazole, intravenous dextrose, epinephrin and pitressin have been used in the treatment of coronary disease, particularly in the cases of shock and pulmonary edema. The action of most of these drugs on the coronary blood vessels is not definitely known. However, metrazole and coramine have been reported to dilate coronary blood vessels and epinephrine in small doses is known to be a coronary dilator, but in large doses causes coronary constriction.

Pitressin is a very potent coronary constrictor and should not be used in this disease.

Summary

1. The place of drugs in the clinical management of coronary disease has been discussed.

2. The action of several drugs, both as to their clinical effect in treating patients with coronary diseases, and the experimental evidence of their action on coronary flow, has been cited.

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RETRODISPLACEMENT OF THE UTERUS*

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THE term retrodisplacement refers technically to all conditions of retrocession, retroflexion, or retroversion of the uterus. By the common usage of most authors and in this paper, it designates the frequently encountered combined retroversion and retroflexion or the retroflexioversion of some writers.

In the preparation of this paper, the writer has analyzed the charts of 148 consecutive patients operated upon for surgical correction of this condition in St. Luke's and St. Mary's Hospitals, Duluth, and also sent a questionnaire to the

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patients concerned to determine their judgments as to the effectiveness of the treatment in relation to amelioration of symptoms.

History

Retrodisplacements of the uterus were recognized in the time of Hippocrates and were even then treated by means of crude pessaries. Devanter, in 1716, described retrodisplacement in pregnancy. Hunter, in 1776, made an unsuccessful attempt to replace an incarcerated four months pregnant uterus. The woman died, and at autopsy it was necessary to sever the symphysis with a saw in order to remove the uterus from the pelvis. Hodge, in 1860, and Albert Smith at about the same time devised the modern pessaries which bear their names. From 1888 to 1890 operative procedures for correction of retrodisplacement became highly developed and began to lead to many abuses.

Etiology

The uterus is normally held in proper position by means of the support which it receives from the pelvic floor, particularly the endopelvic fascia. Its lateral motion is limited by the broad ligaments, and anteversion is maintained by the posterior traction of the sacro-uterine ligaments upon the lower uterine segment and the anterior traction of the round ligaments upon the upper corpus. Of great importance also is the downward pressure of the abdominal viscera upon the posterior-superior aspect of the corpus. The uterus is, of course, freely moveable within wide limits and is moved normally to a considerable degree by the distended bladder. Congenital or acquired loss to any great degree of any of these supporting forces allows the uterus to be forced into retrodisplacement, aided at times by an overdistended bladder, insinuation of a portion of the bowel between uterus and bladder and the sheer weight of an enlarged uterus in early pregnancy or during postpartum involution. Fundamental to the development of this condition is the fact that the pelvic architecture as regards the uterine supports as well as many other characteristics was designed so as to be more suited to the "all fours" than to the upright posture. This departure to the upright position is even more exaggerated in the woman with less than normal lumbar lordosis who has a nearly horizontal pelvic inlet.

Many authors who have covered large series of cases agree quite generally that about 20% of adult women have retrodisplacement of the uterus. This condition may be divided into two categories: congenital and acquired. Dannreuther[2] found in a series of 387 cases of retrodisplacement that 19 per cent were congenital.

Symptomatology

As to the symptoms arising from retrodisplacements of the uterus, there is a difference of opinion. According to Curtis,[1] Thielhaber in 1885 was the first to state that uncomplicated retrodisplacement causes no symptoms. This same author states that Sellheim and Von Jaschke in Europe, and Bovee, Baldy, Findley, Hirst and Plass in this country have expressed the same views. On the other hand, Graegert, Stroeckel, Meyer, Polak, Gellhorn, Curtis, C. Jeff Miller, Lynch and Crossen hold the opinion that retrodisplacement may if long continued lead to characteristic pathology in a definite sequence. For this reason, it may be advantageous to consider first the complications and frequently co-incidental pathology in order to better understand the symptoms associated with this condition.

The retrodisplaced uterus allows the ovaries to prolapse into the cul-de-sac and because of torsion upon the uterine and ovarian vessels with increase in venous pressure, there ensues a chronic passive congestion of the uterus and the ovaries and often the tubes as well. Large varicosities develop with great frequency in the broad ligaments and although study of 148 operative records in Duluth shows only five instances where there is mention of the presence of varices with retrodisplacement, nevertheless, I believe that we all see this complication frequently enough. Lynch[6] demonstrated broad ligament varices in 99 of 100 women operated upon for cure of retrodisplacement. The presence of the varices per se with pressure and anoxemia undoubtedly accounts for much of the pelvic discomfort experienced by most women with a retrodisplaced uterus. The congestion of the uterus often causes it to enlarge and the experience of observing a uterus involute dramatically after correction of retroversion by pessary or operation has been observed frequently. The added weight of the congested uterus must contribute to the sensation of pelvic pressure, and the partial anoxemia of a muscular organ would

be expected to cause discomfort. Much the same mechanism must explain the backache so frequently present. The congestion is also accompanied by an overactivity of the cervical glands and makes leukorrhea a common symptom.

Interference with the blood supply to the ovaries is often manifested by congestive enlargement, tenderness and pain, and also by the rather frequent development of ovarian cysts. Twenty-four per cent of the Duluth series had ovarian cysts at operation. Ovulation pain, or the Middelschmertz of the German writers may be in some cases a manifestation of altered ovarian physiology due indirectly to retrodisplacement of the uterus with ovarian prolapse. I have observed two women with severe ovulation pain as the presenting and only symptom in which correction of the position of the uterus with a pessary led to cessation of the symptom, where removal of the pessary and recurrence of the retrodisplacement reinitiated the ovulation pain and where surgical correction was elected by each patient and gave complete relief.

One woman in the series reviewed was operated upon with preliminary diagnosis of ruptured ectopic pregnancy and a bleeding corpus luteum cyst containing 500 c.c. of blood was discovered together with the retrodisplacement. This marked disorder of ovarian function may have been partly brought about by the abnormal position of the uterus.

Retrodisplacement of the uterus is evidently capable of causing retrograde menstruation and by the same token may be a factor in the etiology of endometriosis.

Watkins[9] has demonstrated that introduction of methylene blue into the uterine cavity without pressure is followed by its appearance free in the pelvis in four of five cases. He showed that of eight patients operated upon for retrodisplacement in whom preliminary dilatation and curettage was performed, that each had from 5 to 60 c.c. of blood in the peritoneal cavity and blood was discovered dripping from one or both tubes in all eight. In another group of eight patients with retrodisplacement operated upon during menstruation, he found that all showed some degree of retrograde bleeding and endometrial cells were found in the pelvic blood of two. He found that of fifteen patients with dysmenorrhea and endometriosis, fourteen had retroversion.

The uterine congestion, angulation of the cervix, retrograde menstruation and altered ovarian function probably all contribute to make menstrual abnormalities common accompanyments of retrodisplacement. In the Duluth series, 24 per cent had dysmenorrhea mentioned in the interns' history, 19 per cent had menorrhagia, and 5 per cent had metrorrhagia.

A summary of the symptoms in the Duluth group of 148 cases as taken from the interns' histories is as follows:

	Per cent
Backache	49
Low abdominal pain	44
Limited to RLQ in 19%	
Limited to LLQ in 4%	
Dysmenorrhea	24
Menorrhagia	19
Pelvic weight or pressure	15
Leucorrhea	12
None mentioned	8
Fatigueability	1

Mittelschmertz, Dysuria, Habitual abortion, Nervousness, and Nausea and Vomiting with Menses, 1 case each.

In a comparable group of 145 cases operated upon by Curtis and Gardner[5] they found:

	Per cent
Abnormal uterine bleeding	65
Dysmenorrhea	56
Low abdominal discomfort	47
Backache	44

In their series, 94 per cent had associated pelvic disease.

In the Duluth series, the operative notes mention retroversion alone in 23 per cent leaving 77 per cent with associated pelvic pathology. However, in only three cases is *mention* made of coincident broad ligament varices while they were probably overlooked many times. It is common practice in Duluth to perform prophylactic appendectomy at the time of laparotomy, and of the 26 per cent in which appendectomy was the only other procedure noted, many of the appendixes were probably not pathological, although no accurate evaluation of this point is possible.

A summary of the operative findings is shown in the accompanying report.

The concealed complication which is usually present in symptomatic retrodisplacement is congestion.

It must be ever born in mind in approaching the subject of uterine retrodisplacement that the condition itself may be symptom-free and also

ASSOCIATED PATHOLOGY
148 Cases

	Per cent
Retroversion alone	23
with chronic appendicitis	26
with acute appendicitis	2
with single larger ovarian cyst	17
with small retention cysts	7
with prolapse and cystocele or rectocele	10
with rectocele and/or cystocele	10
with chronic salpingitis	10
with lacerated cervix	7
with fibroids or fibroid uterus	6
with endocervicitis	5
with broad ligament varices	2
with tubo-ovarian abcess	1
with endometriosis	1

that nearly all of the symptoms that might be ascribed to a retrodisplaced uterus can be produced by other disease sometimes entirely unrelated. All other types of pelvic disease must be differentiated from retrodisplacement of the uterus as well as low back sprain, chronic appendicitis, hemorrhoids, constipation, urological disorder, and referred pain from an intraspinal lesion.

The first appearance of retrodisplacement is frequently after pregnancy, and the onset of chronic backache from lumbo-sacral or sacro-iliac subluxation is likewise often during or after pregnancy, so that the two may exist simultaneously, and if care is not taken, may lead to confusion and inappropriate therapy. Findley[4] states that most postpartum backache is not due to retrodisplacement.

Dannreuther[2] states that "If a sacral backache can be relieved by such measures as unloading an obstipated colon, treatment of postpartum parametritis, fitting flat feet with suitable supports, eradication of remote foci of infection and orthopedic treatment to remedy abnormalities in the lower spine, even though a displacement of the uterus exists, the time to find this out is before a futile laparotomy and not afterwards."

The diagnosis of retrodisplacement of the uterus depends upon careful bimanual pelvic examination or combined recto-vaginal-abdominal examination and the finding of the corpus posterior to the long axis of the vagina or in the cul-de-sac. The bladder should always be empty at time of examination. Not too much weight should be placed upon the finding of the cervix pointing forward although this is definitely suggestive. Every patient with retrodisplacement of the uterus and symptoms that might be explained by it is entitled to a therapeutic test of correction of the position and maintenance with a pessary to determine whether or not her symptoms disappear and are therefore attributable to the retrodisplacement. Certainly, this is true before operative treatment is undertaken.

Therapy

The prophylaxis of retrodisplacement of the uterus largely resolves itself into the removal of uterine tumors which by their position and weight seem likely to pull the fundus backwards, and the proper handling of the postpartum uterus, as the majority of acquired retrodisplacements appear following pregnancy. To this end, the knee-chest exercise was used in the middle of the 10th century by Camper and described in 1701 by Devanter. It has become time-honored and widely used. Schauffler[8] in 1932 reported a controlled series of postpartum cases in which those who used knee-chest exercises for six weeks had an incidence of 47.2 per cent retrodisplacements, and those who did not, had an incidence of 34.5 per cent. Eichner[7] in 1937 presented a similar series with 22.7 per cent following use of knee-chest and 27.7 per cent without it. Moses[7], in 1939, presented a study of a series of 210 girls in a maternity home who carried out knee-chest exercises under supervision from the tenth to the forty-second day postpartum. A control group of 210 patients who did not use the exercise was compared. In each group, 35.2 per cent had retroversion at the end of six weeks. He found in 200 private cases who started exercises on the tenth day postpartum and who had any existing retroversion corrected and pessary inserted on the fourteenth day, that whereas 30 per cent required replacement, 50 per cent of these were cured by the end of six months, and only 14 per cent of the total group continued to have retrodisplacement. This figure compares very favorably to the 20 per cent of all women having retrodisplacement as found by Polak and Stacy in compiling large series from the literature, and it is the opinion of several authors that during involution an opportunity is afforded in many

cases to permanently correct a retrodisplacement that had existed long before pregnancy began. On the other hand, Findley[4] states that without appropriate therapy 100 per cent of patients with pre-pregnancy or intra-pregnancy retroversion develop it afterwards within four weeks. He states further that retrodisplacement first occuring during pregnancy has a 65 per cent chance of being cured by proper use of a pessary postpartum. He feels that there is no hope of curing retrodisplacement with non-surgical treatment except postpartum. He hints that retrodisplacements are quite common in sanitoria patients and that lying on the back and over-distention of the bladder postpartum contribute to the cause of this complication.

In skilled hands, there are relatively few retrodisplacements which cannot be replaced by bimanual technique. Not infrequently, the use of a tenaculum on the cervix with traction downwards will aid greatly in straightening out a retroflexed or retroverted uterus, and then by carrying the cervix along the hollow of the sacrum, it becomes much easier to grasp the fundus with the hand which is upon the abdomen. Occasionally, when only partial correction of the retroposition is possible, considerable aid may be had from placing a small pessary to maintain this partial correction and instructing the patient to take the knee-chest position. This procedure should, of course, be carried out with great care and judgment and the pessary removed if painful or if not successful in two or three days. In some instances, general anesthesia must be resorted to. Needless to say, at the final fitting the pessary should be adequately large to hold the uterus in position, but of such size and moulded to such shape as to avoid pressure ulceration of the vaginal mucosa. The pessary designed by Findley, shaped as the Albert Smith model but with soft rubber inserts at both ends is very convenient in that it causes little or no pain while being inserted.

Operative Treatment

Retrodisplacement can be considered as an indication for a replacement operation according to Wiley[10] only after consideration of the following axioms:

"First: A retrodisplacement may exist without symptoms, especially when found early or late in life. A symptomless retrodisplacement does not warrant surgical procedures.

"Second: Retrodisplacement may exist with symptoms, and the symptoms not be due to the retrodisplacement. Surgical procedures are indicated after extra gynecological conditions have been excluded, and the displacement and symptoms correlated.

"Third: Symptoms in a given case may be correlated with a retrodisplacement of the uterus; but non-operative treatment may relieve the symptoms. Therapy then becomes elective, and the choice of therapy becomes the prerogative of the patient. Usually a woman prefers operation to the continued, often ineffective, conservative treatment with pessary, knee-chest position, packing, et cetera."

Perusal of the literature demonstrates no unanimity of opinion as to the most desirable surgical technique for correction of retrodisplacement.

Olshausen, about 1880, was the first to perform a suspension operation, but his procedure has few advocates today. The Alexander Adams technique with shortening of the round ligaments through the inguinal canals has several warm advocates, but its use is somewhat limited because of the fact that it allows of very limited or no exploration of the pelvis and unless extended considerably, allows for no correction of associated pathology.

The Gilliam is the outstanding pioneer operation utilizing the round ligaments and of course has been modified by Ferguson, Simpson and Crossen to prevent a gap between the fundus and the abdominal wall. The Baldy Webster procedure seems to be generally in greatest favor, and particularly if associated with shortening of the sacro-uterine ligaments and advancement of the bladder towards the fundus offers one of the most effective and fool-proof means of suspension.

Anterior plication of round or broad ligaments or both, reefing of the round ligaments, defundation, verofixation and hysterectomy have their obvious indications.

Association of retrodisplacement with prolapse or cystocele or both suggests the use of interposition operation together with the added insurance of strengthening of the perineal body if necessary.

In the Duluth series under consideration, the procedures undertaken were as follows:

OPERATIVE PROCEDURES

For Correction of the Retrodisplacement	
Baldy Webster	102
Baldy Webster with shortening of utero-sacral ligaments	12
Hysterectomy	11
Anterior plication	9
Interposition	6
Gilliam	2
Coffee	2
Defundation	2
"Position corrected"	1
Replaced without fixation	1
	148 Cases

ASSOCIATED PROCEDURES

Appendectomy	66
Excision of ovarian cyst	29
Perinorrhaphy	27
Salpingectomy	14
Oöphorectomy	13
Sturmdorf	6
Myomectomy	6
Cautery	8
Ligation of broad ligament varices	5
Hemorrhoidectomy	5
Trachelorrhaphy	4
Colporrhaphy	4
Sterilization	4
Resection of presacral nerve	3

There was no operative mortality. These 148 operations were performed by thirty surgeons, one having performed twenty-one operations, another sixteen, two thirteen, two eleven and the rest of the surgeons each having done fewer operations.

Questionnaires sent to all 148 patients operated upon in the Duluth series inquired as to the nature of the pre-operative symptoms and the degree of relief obtained (complete, two-thirds, one-third or none). Each was asked whether to her knowledge the surgeon had made an attempt to correct the retrodisplacement prior to the time of operation; whether this attempt was successful; and whether, if successful, it had afforded temporary relief.

There have been 105 replies. Symptoms were listed as shown in the accompanying table.

The one patient who complained of urinary disorder was made worse and the one suffering from habitual abortion was not cured by operation.

The number of symptoms in each case varied from one to five. Considering all of the symptoms presented in a given case, the result for that patient was estimated on the basis of excellent, fair, poor, and failure, depending upon the degree of relief experienced as complete, two-thirds, one-third, or none. There were undoubtedly instances where the patient expected relief greater than such an operation could afford, but one should be free to assume that had the surgeon expected only partial relief as from backache caused by both retrodisplacement and low back sprain that he would have so informed the patient, and her expectations therefore would have been reasonable. One debated for some time before designating two-thirds relief as fair instead of good, but we must feel that only the expectation of excellent results would warrant a woman in submitting herself to the risk, expense, and loss of time attending a major operative procedure which was elective in nearly every instance. A patient who submitted herself to such a procedure and obtained only one-third relief would, I am sure, feel that the results were poor indeed.

SYMPTOMS

	No. Cases	Results		
		Satisfactory		Unsatisfactory
Backache	75	55	73%	20
Low abdominal pain	70	56	80%	14
Dysmenorrhea	43	35	81%	8
Menorrhagia	24	20	83%	4
Sterility	9	2	22%	7
Nervousness	5	2	20%	3
Dizzy spells	4	4	100%	0
Metrorrhagia	3	1	33%	2
Pelvic pressure	3	2	66%	1
Fatigability	2	1	50%	1
Leucorrhea	2	2	100%	0
Mittelschmertz	1	1	100%	0
Nausea with menses	1	1	100%	0

The results are presented with the full appreciation of possible inaccuracies of judgment because of limited data:

	Cases	Per cent
Excellent (or complete relief)	62	59
Fair (or two-thirds relief)	23	22
Poor (or one-third relief)	12	11.4
Failure (or no relief)	8	7.6

Accordingly it may be stated that results were satisfactory in 81 per cent and unsatisfactory in 19 per cent. There was one recurrence of retrodisplacement found elsewhere subsequent to operation in Duluth. Curtis and Gardner in their report of 145 cases obtained "complete symptomatic results and excellent clinical result" in 85 per cent.

As indicated, each patient was asked whether or not an attempt was made to replace the uterus prior to operation, and if so, whether it was successful and was followed by relief of symptoms. Of the 105, forty-seven stated that the attempt was made and only eighteen that it was successful. In each instance where correction was accomplished, relief of symptoms followed, and the postoperative results were fifteen excellent, two fair and one poor—well above the average for the series. The postoperative results in the group of twenty-nine patients with attempted but unsuccessful pre-operative replacement were fifteen excellent, nine fair, three poor and two failures.

Of the entire group of 148 cases, the operative notes mentioned adherent retrodisplacement only eight times. Of the 105 who replied, only four proved at operation to have adhesions preventing replacement, yet the records indicate successful replacement in only eighteen.

Of course, the patients' judgment as to whether attempted correction was undertaken prior to operation may not be accurate, but forty-seven known attempts in 105 patients and only eighteen successful replacements in the presence of only four adherent retrodisplacements are figures that even if quite inaccurate are much too low.

Since so few retrodisplacements cannot be at least temporarily corrected conservatively and since such a great correlation exists between the results obtained with correction maintained by pessary and the postoperative results, a much greater effort should be made in this direction.

Of the eight patients who obtained no relief, all were elective, none was associated with serious pathology in the pelvis, only one was adherent, and it was the one with urinary disturbance which was *worse* postoperatively. This patient and three others had an unsuccessful pre-operative attempt at correction, one of the others had successful pre-operative attempt with relief of symptoms, but had a postoperative recurrence of the retrodisplacement with return of all symptoms. The other three state that no pre-operative attempt at correction was undertaken.

Summary and Conclusion

A review of the literature on the subject of retrodisplacements of the uterus has been presented together with an analysis of 148 cases of this condition operated upon in Duluth by thirty surgeons. The results were satisfactory in 81 per cent and unsatisfactory in 19 per cent. It has been emphasized that the pre-operative replacement of an apparently symptomatic retrodisplaced uterus is essential in order to insure the highest degree of postoperative success, and where replacement is impossible even in skilled hands, very great effort should be made to rule out all other causes for the symptoms. One should hesitate long before assuming that a retrodisplaced uterus which one cannot correct bimanually is actually adherent.

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TUBERCULOSIS ON THE COLLEGE CAMPUS

A college president who would never tolerate a contaminated water supply on his campus must learn not to permit an open, broadcasting case of tuberculosis loose among his young people. Sneaking tuberculosis must be painted as the crippler and killer it is, more to be feared than the sporadic, dramatic visits to the campus of such well publicized maladies as influenza, measles or mumps. Mild illness in the mass fills the headlines, while deadly tuberculosis, working twenty-four hours a day in its own quiet fashion, goes on filling sanatorium beds and cemetery plots.—Charles E. Lyght, M.D.

THE INTERPRETATION OF SEROLOGICAL TESTS FOR SYPHILIS

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THIRTY years ago the interpretation of results of serologic studies was simple—a positive or negative report of a single test was accepted at its face value in the diagnosis of syphilis. Today the problem is entirely different—using a battery of two to eight technics, the result of each technic is reported in one of six accepted terms, and the report cannot be applied without clinical interpretation. Critical judgment must be used because all the present tests are non-specific. It is obvious that the value of serologic studies will be greatly increased with the development of a truly specific test for syphilis, perhaps the chemical identification of reagin. Unfortunately, in the course of developing such a test there will probably come into use even more tests in addition to the fifteen or twenty which are today accepted as having sufficient value to justify continued use. With such a variety of technics and with the increased number of tests on each serum specimen, the clinician will receive even greater numbers of conflicting reports. He may wish for a conclusive report of a single test, but he knows that his needs today are best served by the performance of an exclusion test and at least one complement fixation and one diagnostic flocculation test.

Since one cannot expect the immediate solution of this problem of false positive or negative reports and conflicting reports it has recently been suggested that the recording of results be modified to assist the average clinician. Moore and Eagle[2] urge increasing the responsibility of the director of the laboratory by provision for a single summarizing report of positive, doubtful or negative; the detailed report of each test might be given on the reverse of the form or in smaller type. Justification for this suggestion lies in the fact that the primary responsibility for conflicting reports is not in the clinic but rather in the laboratory even though the technic and personnel may be of approved quality. An advantage of this system would be the opportunity for interpretation of daily fluctuations in sensitivity and specificity which can be known only to those having access to reports on numerous specimens. Such a report would also lessen the confusion of the average clinician on confrontation with unfamiliar names when more than two or three technics are reported. In many cases the clinician might welcome the general advice of a serologist or syphilologist even though the specialist had no other knowledge of the patient's condition.

The presence of syphilis is practically excluded by a negative report to a sensitive "screen" test (e. g., Kline exclusion or Kahn presumptive). Doubtful or positive reactions are so insignificant that they need not be reported to clinicians. If the result of an exclusion test is doubtful or positive, the specimen is then tested by a complement fixation (Kolmer) and a standard flocculation test (Kline or Kahn); negative results on these tests afford practically conclusive evidence that the positive reaction to the exclusion test was an error.

Negative reports to standard tests exclude the probability of syphilis except in the following circumstances. (1) The reaction may not become positive in the first week or two that the chancre is present. (2) Following the treatment of syphilis a change to serologic negativity usually precedes cure. (3) With modern serologic technics one rarely finds clinically active untreated syphilis associated with negative serologic tests, but in the absence of clinical symptoms an undetermined number of persons spontaneously achieve serologic negativity. (4) In an apparently normal child born of a syphilitic mother the reaction may be negative on cord blood or in the first few weeks of life and still the child may later develop certain evidence of congenital syphilis.

In the presence of clinical evidence one can accept a single positive report as diagnostic of syphilis. In the absence of other signs a diagnosis of syphilis should never be based on reports on a single specimen because non-syphilitic conditions can cause transitory positive reactions. Repeated strongly positive (4+) reactions are rarely reported in the absence of syphilis; leprosy, yaws, and possibly a few other diseases are exceptions. False strongly positive reactions are occasionally reported on the cord blood or in the first few weeks of life of a normal child born of a syphilitic mother.

The recent report of the local Committee on

the Study of Serological Evaluation[1] shows that Minnesota clinicians are fortunate in having very satisfactory laboratories for serologic testing, but even in good laboratories the number of doubtful or conflicting reports may equal the number of significant strongly positive reactions. In 3,764 patients recently admitted to the University Hospitals the incidence of subsequently diagnosed syphilis was nearly 1.5 per cent, but misleading serologic reports were obtained in 2 per cent of the whole group. When there is clinical evidence of syphilis, it is obvious that partially positive serologic reports are probably significant, but in the absence of other demonstrable evidence one must look askance at reports of 1+, 2+, or 3+ reactions even on multiple specimens. One must also be suspicious of falsity when on the same specimen positive reactions by one technic are accompanied by negative reactions to another.

It is the consensus of syphilologists that clinicians too often interpret doubtful or 2+ or 3+ reactions as positive evidence of syphilis. Patients with such reactions must be searched for clinical evidence, and if the reactions persist, the spinal fluid must also be tested. If the results are negative, most of the patients are subsequently shown to be non-syphilitic or at least no further evidence of syphilis can be demonstrated. A few normal people have persistently doubtful serologic reactions or serum positive to one technic but negative to all others. In the recent survey of University Hospital patients it was noted that the vast majority of doubtful reactors were subsequently discharged as non-syphilitic.

Stress has previously been placed on the interpretation of serologic reactions during antisyphilitic treatment, but syphilologists are critical of dependence on such reactions as criteria of response to treatment. After establishment of the diagnosis, it is likely that more satisfactory results would be generally obtained if treatment were based on authoritative schedules and little or no attention paid to serologic reactions. Nevertheless, serologic tests have a limited value in following the progress of treatment and the course of the disease. Early reversal to a negative reaction must not lead to administration of less than the advised number of injections. Neither should persistent positive reactions be regarded as a need for treatment beyond the accepted amount. Patients with persistent positive reactions must have careful clinical study to demonstrate a site of activity of the infection, but such evidence is seldom found. Most individuals with normal spinal fluid but persistently positive blood reactions are clinically cured after two or three years of treatment. The results of lumbar puncture are much more significant than serologic studies on the blood.

During the course of treatment the most significant serologic change is the reversal to positive of a previously negative reaction. The need for lumbar puncture is then imperative as is a thorough clinical examination which must include a search for cutaneous or mucous membrane relapse. A relapsing serologic reaction usually, but not always, requires continuation or reinstitution of therapy. Reinfection with syphilis is rare but must be kept in mind as a possible cause of the positive reaction.

Less frequently, but not rarely, clinicians are confused by reports on specimens of spinal fluid. False positive or negative reactions are probably not common but partially positive reactions may be a source of trouble. In general, the interpretation of these reports may be governed by the general rules applicable to reports of tests on blood serum. If the report of a previous test was negative or if no treatment has been given a partially positive reaction is likely not to be significant.

Summary

Critical review of current serologic knowledge shows that the proper interpretation of reports of serologic tests for syphilis is made difficult by the multiplicity of tests and the complexity of the reports as well as by doubtful reactions and false positive or negative reactions. Strongly positive reactions in the blood or spinal fluid usually indicate the presence of syphilis, though they are poor evidence as to the need for treatment or the degree of infectiousness. Negative reactions to an exclusion test eliminate the need for worry except in a few instances which the clinician may be expected to keep in mind; negative reactions to standard tests need not mean the patient is already cured, nor do they prove that he cannot infect others. Doubtful reactions are the chief cause of confusion, and they must be followed by careful reëxamination of the patient; in untreated cases most of the doubtful or conflicting reports can later be shown to be non-significant.

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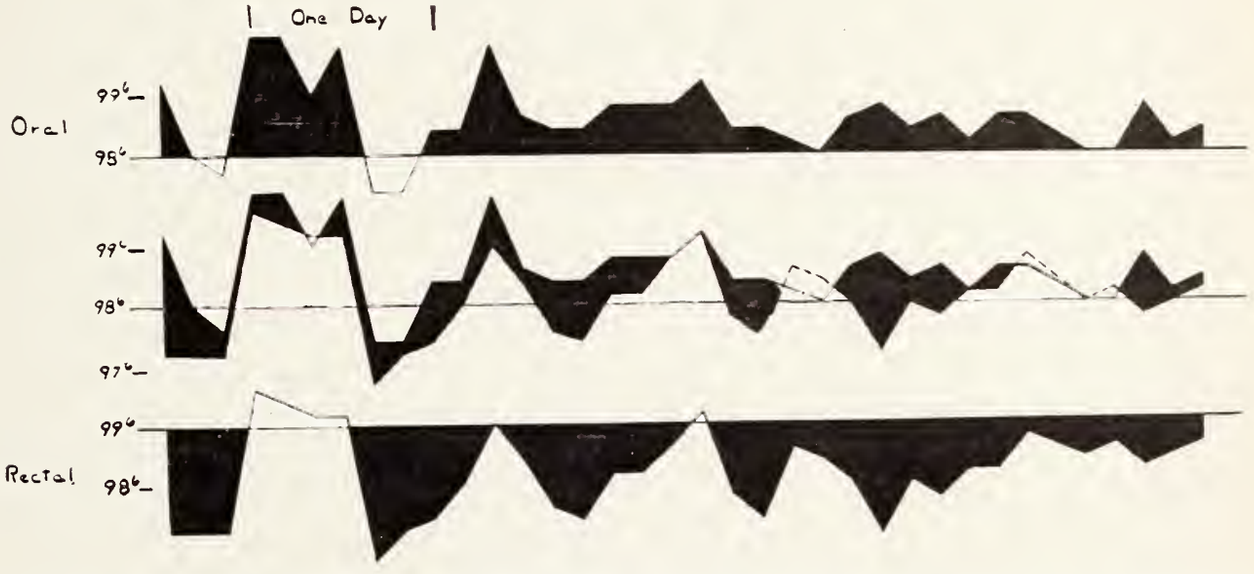
CHRONIC LOW-GRADE ORAL TEMPERATURE OF LOCAL ORIGIN IN CHILDREN

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THE possibility of regional warmth due to infection in the nasal sinuses producing an elevation of oral temperature in children has not been sufficiently stressed. As a result many such children are erroneously thought to have a generalized fever of low grade, and thus are forced to suffer the consequences of grave anxiety that this often produces.

tually lower than the former. When the patient was permitted to be normally active the oral temperature soon disappeared.

Since that time I have encountered the same situation sufficiently often to realize that regional heat due to infected sinuses is not uncommonly responsible for a low-grade elevation of the mouth temperatures in the absence of general



The three graphs indicate oral and rectal temperatures separately, and the two together. The shaded areas represent temperatures above normal on the oral graph, subnormal on the rectal, and the excesses of oral over rectal temperatures on the combined. The empirical, though controversial, level of 99.6 has been assumed for normal rectal temperature.

This fact first came to my attention through the case of a boy four years of age. He had spent a large part of the previous winter in bed as a result of repeated exacerbations of a chronic nasal sinusitis. In March he developed a mild attack of scarlet fever following which the infection of the nasal sinuses persisted in a more active state, giving rise to constant mouth temperature between 99 and 100. Tuberculosis and other diseases of a general nature were ruled out by proper tests, and we felt confident that the origin of the fever lay in the nose and throat. At the end of six weeks the tonsils and adenoids were removed without effect on the temperature. Finally, wondering if the apparent fever could possibly be local from proximity to the nasal sinuses, I asked the nurse to record both oral and rectal temperatures. To my surprised satisfaction the later were normal, often being ac-

fever. The following case is reported by way of illustration:

Case Report

A girl seven years of age had had whooping cough about two months previous to my seeing her. Since then she had continued to cough. Her temperature had been slightly elevated more or less constantly. In addition a certain amount of headache and fleeting pains around the head and neck had been complained of. She was confined to the hospital for one week, where the cause of symptoms was found to be a wide-spread infection of the nasal sinuses. During her stay at the hospital both oral and rectal temperatures were recorded. Those by mouth were found to be consistently elevated and usually above the rectal temperatures. The later were almost never above normal and usually below. These facts are graphically presented in the accompanying diagram.

It so happens that in the cases in which I have

observed this phenomenon nasal sinusitis has been the responsible element. It is possible that other chronic infections of the nose and throat, such as diseased tonsils and adenoids might also accomplish the same result. I do know that acute tonsillitis may raise the mouth temperature above the rectal, and have been watching to see whether such reversal of temperature relationships might not have some value in the differential diagnosis of fever.

Conclusions

Chronic low-grade elevation of oral temperature in children may be part of a regional thermal reaction resulting from nasal sinusitis, the general body temperature as recorded at the rectum being normal.

THE PRACTICAL APPLICATION OF PROTAMINE ZINC INSULIN IN THE TREATMENT OF DIABETES MELLITUS*

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PROTAMINE zinc insulin has been used in the treatment of diabetes mellitus since 1937. The original compound as prepared by Hagedorn has undergone slight modification, but basically the product is still regular insulin mixed with protamine to which small quantities of zinc have been added. The resulting mixture is much less soluble and is, therefore, more slowly absorbed in the subcutaneous tissue than the clear, soluble insulin hydrochloride discovered by Banting and Best.

Since protamine zinc insulin became commercially available, thousands of patients with diabetes mellitus have been treated with it, and certain clinical facts have been established by numerous clinical investigators in the United States and abroad. All have agreed that protamine zinc insulin acts more slowly than regular insulin; that during the first three to six hours it shows little if any activity as judged by its effect on the blood sugar; that its pharmacological effect continues for at least twenty-four hours with moderate doses, and longer with larger ones; that reactions, though less frequent, are characterized by suddenness of onset and are severe and prolonged, and that many patients have reported a definite subjective improvement from its use.

For the satisfactory control of diabetes mellitus at least three variables must be considered. The first of these variables is the patient himself. No two diabetic patients are alike. Why one patient differs in response to treatment from that of another is not known. It may possibly indicate that there are different forms of the disease. The juvenile, adolescent, and early adult, and also the asthenic individual are generally found to have severe diabetes that is relatively refractory to treatment. In these cases the blood sugar is likely to be unstable, so that glycosuria is difficult to control and insulin reactions readily occur. On the other hand, the obese adult, senescent, and senile individuals have as a whole relatively mild diabetes and fairly stable blood sugars. Fortunately, this group is numerically greater. All of us know that the most stable patients become unstable during an emotional upheaval, an intercurrent infection, an associated hyperthyroidism, or following operations.

The second variable factor is the diet. There are several schools of thought in regard to this variable. There are those who advocate a high carbohydrate, low fat diet, or a high fat, low carbohydrate diet, or a diet midway between these two extremes. There are others (particularly in Europe) who have reported impressively satisfactory results from normal or free diets, but since we are attempting to stabilize as many variables as possible, the use of the free diet seems hardly justifiable. Needless to say, dietary regulation during the present Hagedorn era of protamine zinc insulin remains predominantly important. Until we learn how to prevent or cure diabetes dietary control will remain the most important item in prescribing for the diabetic patient.

The third variable factor is insulin. When

*From the Fargo Clinic, Fargo, North Dakota. Read before the annual meeting of the Minnesota State Medical Association, Saint Paul, Minnesota, May 26, 1941.

protamine zinc insulin was discovered, it was believed that the variable of insulin had been solved. Like all new therapeutic agents, the best side is apt to present itself first, and only on longer acquaintance reveals the disagreeable traits which detract from their usefulness. Despite technical refinements and improvements in the uniformity of the new insulin products, frequent failings in the slower acting insulins have become apparent with extended experiments. Briefly, these failings were manifest in diurnal glycosuria; in the necessity for supplementing the zinc protamine insulin with injections of regular insulin; in serious, rarely fatal, reactions; and often, in fact, in such erratic diabetic control as to force the abandonment of protamine zinc insulin in many cases where its aid would have been most welcome.

By far the most objectionable feature encountered with the use of protamine zinc insulin is the danger of grave hypoglycemic reactions. Unlike the reactions from ordinary insulin which come on rapidly after administration, most often during the day, and are quickly controlled by orange juice, the reactions from protamine zinc insulin are insidious in onset, come on during the night, tend to be prolonged, severe, recurrent, and are little and only temporarily influenced by the customary sip of glucose. So ominous were these potentialities in the newer insulins that they were the subject of an editorial warning in the *Journal of the American Medical Association*,[1] a warning issued during the time of our greatest enthusiasm for this new therapeutic agent. This editorial reviewed the evidence necessitating this notice and stressed the fact that protamine zinc insulin was not, as some had hoped, a fool-proof substitute for the older insulin. It might be stated, however, that this is not entirely the fault of the insulin, but probably the result of its misuse. In an effort to control the severe cases with a single injection of protamine zinc insulin, many of us have been guilty of giving too large an amount. There are at least two ways to overcome this disadvantage: (1) first, by using both unmodified and protamine zinc insulin which will be discussed later; (2) by arranging the meals so that less of the carbohydrate and protein foods are given for breakfast, and more are reserved for the noon and evening meals.

As an improved method of preventing nocturnal reactions from a morning dose of protamine zinc insulin, Sprague[8] has suggested that a glass of milk and a few crackers be given before bedtime. Pollach and Lande[6] have suggested a protein feeding at bedtime and the omission at breakfast of foods containing immediately available sugar, such as fruit juices. S. Harris and S. Harris, Jr.,[2] recommend six meals in place of the usual three. Margolis and Eisenstein[5] divide the twenty-four hour caloric requirement into four allotments: one-fifth of the total caloric intake at 8:00 a.m., one-fifth at noon, two-fifths at 5:00 p.m., and one-fifth at 9:30 p.m. They feel that in some cases feeding two-fifths of the daily food quota at 9:30 p.m. is the best procedure. The late meal might be one slice of bread, a glass of milk containing 50 grams of 40 per cent cream, and two eggs (or their equivalent in meat or cheese). They believe that under this régime a single daily injection of protamine zinc insulin sufficed for control.

All of these authors are in agreement that the most sustained protection against hypoglycemia, and hence the possibility of insulin fatalities, are eliminated by a late supper or a "protective fourth meal" that will be digested and absorbed slowly while the patient sleeps.

The more frequent occurrence of localized skin reactions in the use of protamine zinc insulin has been given by various authors as one of its chief disadvantages. Kern and Langner[4] reported an incidence of 16 per cent. These authors were of the opinion that most of these reactions were not due to a sensitization to protamine but appeared to be due to errors in the technique of injections, such as too superficial, (i.e., intracutaneous) injection of material; irritation by alcohol when that substance has been used to sterilize the hypodermic outfit; occasionally, to infection, the result of faulty aseptic technique. The errors occurred as a rule when the material was injected by the patient himself. Rynearson,[7] on the other hand, states that within the past several months he has not seen one single case of skin irritation and believes that this reflects improvement in the manufacture of the article.

So manifold are the advantages of protamine zinc insulin that almost all patients who require insulin should receive it either alone, or in combination with the unmodified insulin. As Wilder[9] has so ably stated: "Our reason for using protamine zinc insulin is not so much that it makes

necessary fewer daily injections, or that a saving in the unitage required usually is observed, although both of these are good reasons; the principal advantage of protamine zinc insulin is the continuity of insulin activity obtained with it and difficult to secure with shorter-acting insulins, unless more frequent injections are made than is convenient or practical." Wilder[10] demonstrated experimentally that continuity of insulin activity is necessary to prevent the recurrence at intervals of periods of protein wastage associated with ketosis. In other words, doses of protamine zinc insulin, inadequate in severe cases to completely control glycosuria, provides protection for the tissue proteins and thus makes possible satisfactory treatment with less rigid control of glycosuria than was formerly required.

The administration of protamine zinc insulin in one dose daily before breakfast has now been rather universally adopted, although there may be occasional instances in which injections in the evening are more acceptable. It has been found that small doses of protamine zinc insulin, that is, 20 units or less are exceedingly well borne without the fear of insulin reactions and may be used rather freely. Such amounts of insulin are applicable to the mild cases and serve exceedingly well in controlling them. In some instances, the taking of protamine zinc insulin every other day has been sufficient for control which serves as a demonstration of its effect for more than twenty-four hours. It is rarely possible in severe cases to obtain satisfactory control with protamine zinc insulin alone, and in most cases when the total dose of insulin required exceeds 20 or 30 units, injections of supplementary unmodified insulin are required to prevent marked glycosuria after meals.

In most cases, I now prefer to use the method advocated by Wilder in which only enough protamine zinc insulin is given to provide adequate control during the night and adding to it and mixing what unmodified insulin is required to prevent marked glycosuria during the day. With this combination adequate control can be obtained both of post-absorptive and post-prandial glycosuria with one injection a day given before breakfast. (For the reader who is interested in the technique for the use of mixed insulins in one syringe, reference may be made to Wilder's "Clinical Diabetes Mellitus and Hyperinsulinism" for details.") When using this technique, it is important to draw the dose of unmodified insulin into the syringe first to avoid introducing any of the alkaline protamine zinc insulin into this bottle.

The dose of each component of the mixture of protamine zinc insulin and unmodified insulin may need to be changed daily. Therefore, it is necessary that the patient examine a specimen of urine which is voided before breakfast and of that which is voided before supper. The bladder should be emptied not more than one hour before the specimen for analysis is collected. In other words, urine for testing must be urine recently secreted by the kidney. The result of the test of the urine voided before breakfast indicates whether the protamine zinc insulin component of the mixture to be given should be increased or decreased; that of the test before supper indicates whether the unmodified insulin component is to be increased or decreased. For both components, changes of dosage are made in steps of four units in adults and in two units for children. This rule, however, no longer applies when patients reach the point where they are taking very small amounts of insulin, and, in some instances, it is possible to discontinue insulin entirely, and, if the patient remains sugar-free and well controlled, it may not be necessary to resume it again.

In this procedure, except when the dose of insulin is very small, it is recommended that the patient be permitted to show small traces of sugar in the urine. Some authors do not agree with this recommendation, but in the opinion of Wilder, it is as important for the comfort and safety of the patient to avoid insulin reactions as to prevent other complications, and to insist that the patient's urine should be continuously sugar-free when using protamine zinc insulin is to invite reactions. Blood sugar determinations, however, should be made from time to time to insure against hypoglycemia, but in most cases, urine sugar tests are all that are needed.

Reactions to Protamine Zinc Insulin

I have already pointed out the dangers which accompany the reactions with protamine zinc insulin. Mild reactions are quite common, and we should be more concerned in preventing them than in controlling the glycosuria. The most common symptom is a headache present in the morning when the patient wakes up, and this

may remain during the day or come and go during the day. The next most common symptom is unusual fatigue and weakness after slight exertion. The patients have less warning of a reaction with protamine zinc insulin than with regular insulin, and it is for this reason some of the reactions become markedly severe before the necessity of glucose is ascertained. Other symptoms may be drowsiness, numbness about the mouth, tingling of fingers, blurring of vision, pallor, mental symptoms, trembling, nausea, and finally, unconsciousness and convulsions. The appearance of the earlier symptoms should warn the patient and give him ample time to initiate treatment, if he will recognize their approach. Treatments of reactions should consist in taking about 10 grams of sugar or 100 grams of orange juice followed by some milk or bread or both at intervals of an hour or two until the next meal is eaten. If the reaction is more severe, 10 to 20 grams of glucose should be given intravenously. When in doubt, it is better to treat the patient for hypoglycemia than to permit the reaction to become more serious.

Pre-operative and Postoperative Care of Diabetic Patients

When contemplating operation, it is important that a patient's glycosuria be completely controlled before an operation is scheduled, unless an emergency is necessary, which, fortunately, is not frequent. This may take several days or rarely weeks. Particular attention should be given to the complete relief of all symptoms of acidosis, and the patient should enter the operating room with the concentration of the sugar in the blood essentially normal, and the urine free of sugar. In all cases during the pre-operative period, the patient should be given adequate amounts of carbohydrate foods, and this is particularly true in the presence of liver disease, in order to insure an adequate deposition of glycogen.

On the day of the operation, it is extremely important that the patient not receive so much insulin that he is likely to have an insulin reaction. Patients who are receiving both protamine and unmodified insulin for the control of diabetes should be given only a small amount of protamine zinc insulin on the day of operation, which will have little if any effect until after the operation has been completed, and to delay giving any unmodified insulin until the patient has returned from the operating room. Routinely it is well to obtain blood for quantitative estimates of blood sugar, both immediately before and immediately after the operation, and at intervals for the first day or two, since the patient's urinalysis is of questionable value during this time. The reason for this is that many patients receive glucose intravenously, and it is difficult to know how accurately urine findings reflect the level of the blood sugar. The dose of protamine is repeated daily, but in very small amounts, and unmodified insulin is supplemented to control the glycosuria until the patient is back on a regular diet.

A discussion of the treatment of diabetic coma would involve the writing of a separate paper. Therefore only a few generalities regarding the use of protamine zinc insulin in its treatment will be given. Contrary to earlier reports, protamine zinc insulin, when given in conjunction with unmodified insulin, is of definite value as an adjunct in the treatment of diabetic coma. This was first pointed out by Ingham, Kepler, and Cresler.[3] As a rule, fifty units of protamine zinc insulin may be given to adults at the onset of treatment. At the same time unmodified insulin is administered (perhaps fifty units) and the usual treatment for coma is conducted. It will be hours before the protamine zinc insulin will have any effect. During this time, particularly, many injections of regular insulin may be necessary. For the next few days, protamine zinc insulin is given once daily, the dosage depending largely upon the estimated requirements of insulin in each individual case. Its advantage in coma lies in the fact that it reduces the number of subsequent injections of unmodified insulin, tends to prevent excessive fluctuation in the concentration of the blood sugar, and more important still, will probably prevent the sudden and unexpected "escape from control" which sometimes occurs relatively late in the course of treatment when the patient seems to be on the road to recovery and the physician is inclined to relax his vigilance.

When complicating infections or other emergencies arise, the requirement for insulin temporarily is elevated. In these cases, it is better not to change the dose of protamine zinc insulin, but to supplement it with unmodified insulin to provide the extra insulin that is necessary. This is to avoid bringing up the dose of protamine zinc insulin which may be excessive as soon as the

emergency is past and, because of its long duration of action, cannot be quickly diminished.

Summary

Protamine zinc insulin constitutes an important advance in the treatment of diabetes. With its judicious use, the diabetic may live a more normal and useful life than with the unmodified insulin alone. Hypoglycemic reactions constitute its mose serious drawback. These usually can be prevented by the adjustment of the diet, and the associated use of unmodified insulin. Suggestions regarding its use in postoperative conditions, emergencies, and diabetic coma are discussed.

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ALCOHOLISM AS A NEUROSIS*

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THROUGH a period of about 300 centuries and for a variety of reasons human beings have used alcohol internally. While the reasons for man's ingestion of alcohol may vary, the effect of the drug has remained fairly constant. It is true that different individuals will react differently to the drug, but it is also true that the response of the same individual usually follows a fairly constant pattern. Just when in the history of mankind alcoholism became a social problem is difficult to determine but perusal of ancient documents furnishes convincing evidence that the problem is as old as antiquity.

Advances in our knowledge of psychodynamics have brought about fundamental changes in our concept of what is commonly called "alcoholism." It is a far cry from the Victorian days, embellished with melodramatizations such as can now be seen in a current revival of that old play called "The Drunkard" to our modern, scientific view of the same situation. It may now be taken for granted that everybody who drinks alcoholic liquor is not necessarily a candidate for a sanitarium. Without going into the moral issues involved one can say that the vast majority of people who drink, do so with impunity. In fact, there are many who believe that in the hustle and bustle of modern life the mental and physical relaxation resulting from the ingestion of a reasonable amount of alcohol under proper social control and at not too frequent intervals is distinctly beneficial. At least, it may contribute much to the art and joy of living.

There are, however, people who *never* under any circumstances whatever, should take a drink. These individuals are known as *problem drinkers* and our concepts regarding them are entirely different from our ideas concerning what are referred to as *controlled* drinkers. The former are people for whom the use of alcohol has become a psychological, physical, social, domestic, and personal problem. The latter are individuals who can "take it or leave it," and, with the possible exception of an occasional moment of embarrassment resulting from overindulgence, can relegate alcohol to an inconsequential role in their total life situation. If all drinkers could remain controlled drinkers there would be little to say against alcohol as a beverage.

Now, what is a problem drinker? We have discarded the use of the term "alcoholic" because it implies the taking of inordinately large amounts of the drug. A problem drinker is not necessarily a heavy drinker. Many heavy drinkers go on for years consuming every day what, according to the usual standards, would be considered large amounts of alcohol, and yet suffering no apparent ill effects. On the other hand, there are drinkers for whom two or three highballs a day constitute a problem. These are

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

people who drink not because they want to, but because they have to. They are the ones for whom alcohol is an absolute necessity and whose total life situation is adversely affected by it. They are the unhappy drinkers, the escape drinkers, the men who drink to satisfy some inner psychological need. Many of them never become acutely intoxicated, and yet they never are completely sober. I know controlled drinkers who, on occasion, drink more than some problem drinkers. They get howling drunk on occasions which call for celebrating and they have a good time doing so. Being of somewhat childish natures, they regard getting drunk as harmless and funny, and when they drink to excess they do so because they want to, and not by way of yielding to an uncontrolled habit. Their drinking never has an adverse effect on their total life situation, and if they ever became convinced that there was some adequate reason for giving up alcohol, they could and would do so.

The problem drinker, however, cannot consciously realize that he has a problem, and any implication to the effect that he had better stop and take stock of himself frequently is met with righteous indignation. Yet, let something interfere with *this* man's customary drinking habits and he is devastated. His inner need for alcohol is so deep and so strong that, in spite of the fact that doing so brings unhappiness and poor health to himself and misery to his family, he continues to narcotize himself with alcohol. In other words, the alcoholic antics of controlled drinkers are volitional and occasional, while those of the problem drinker are involuntary and symptomatic.

I say that the indulgence of the problem drinker is symptomatic. In the vast majority if not in all cases the underlying cause lies in the psyche of the individual. Therefore the cure, if one is to be effected, becomes a psychiatric problem. In the light of our present knowledge of psychodynamics the old procedures involving the use of appeals to the patient's better nature, entreaties, reward and punishment techniques, pep talks, trick cures, and apomorphine are about as rational as wearing amulets to ward off smallpox. The problem drinker, in addition to having his total life situation adversely affected by alcohol, frequently displays many other disturbances within the personality. He consistently shows evidences of maladjustment in his family relationships, and in business, social, and other adjustments; as well as emotional immaturity together with other evidences of neurotic behavior. This indicates that the alcoholic pattern is not the total picture but must be regarded as only a symptom and not as a diagnosis. For this reason our therapeutic efforts must be directed primarily at the underlying neurosis and this implies something more than hot baths, thiamine chloride, massage, bromides and pep talks. It means a searching investigation of the personality structure of the patient, analysis of the dynamic factors which have entered into his psychobiological integration, and in many cases a resynthesis of his total personality. Obviously this cannot be done with a few injections of apomorphine.

There is no psychotherapeutic technique which will solve the problem of the drinker who is a constitutional psychopathic inferior individual. One might as well try to change the color of his eyes. His action pattern is constitutional and unmodifiable so no time will be devoted here to a consideration of his type of problem. However, there remain a large number of problem drinkers who can be rehabilitated and relieved of their suffering. In some the alcoholic addiction is an expression of an underlying neurotic or even psychotic depression; in others it seems to be a reaction to some intolerable situation; other victims use alcohol to narcotize feelings of diffidence and self-consciousness which make themselves felt when the individual is forced into social situations to which he cannot adjust. These people are not self-willed, unthinking, inconsiderate hedonists indulging in a vicious but controllable pastime. They are people whose action pattern is closely interwoven with unhappiness, misery, maladjustment, and suicide. Therefore mass or rubber-stamp treatment can be no more successful in the treatment of problem drinkers than it could be in the treatment of patients suffering from brain tumor or from dementia precox. The treatment must be individualized and specialized. It involves a consideration of the patient's physical and psychological structures as well as a detailed study of his family and other social relationships.

The method of treatment which I employ differs in some respects from that used by other psychiatrists, but in the main essentials it follows the same general plan. It is preferable that the patient comes for treatment before he has

passed the age of forty, although some very satisfactory results have been obtained in men who were in their early fifties. Previous experience on the part of the patient with various "cures" seems to be immaterial, and I have seen very satisfactory psychological adjustments achieved by men who have previously been exposed unsuccessfully to a number of "institute" cures.

One absolute prerequisite to the successful treatment of the problem drinker is that he submit to treatment soberly and willingly. He must present himself for treatment with the frank and tacit admission that he has a problem which he is unable to manage by himself, and he must ask to be helped. To have him regain consciousness in a hospital or a sanitarium aftrer having been drugged and shanghaied in by family and friends is to get off to the worst possible start. He is bitter, resentful, and in anything but a coöperative frame of mind. True, with eliminative and reconstructive therapy the alcohol can be eliminated from his body and a certain amount of tissue damage can be repaired, but very little if anything can be done to correct the underlying faults in psychological adjustment. Therefore, it is absolutely necessary for the patient to enter the hospital voluntarily and without mental reservation.

Having begun his treatment under the proper auspices, it now becomes necessary that the problem drinker fully understands his relationship to the psychiatrist. At no time is the problem drinker ever permitted to think that his compliance in the treatment is to be considered a favor to the therapist. Not infrequently when a patient asks for an extension of privileges he will supplement his request with some remark such as, "Don't worry, Doctor, you can trust me out alone. I won't let you down after all you have done for me." I invariably make it unmistakably clear to the patient that his success or failure in treatment in no way affects me. There is only one person who is ultimately affected by success or failure on his part and that is himself. I point out to him the fact that he came in of his own free will and accord, that he admitted he had a problem he was unable to manage alone, and he asked to be helped. Therefore I was not going to let him get away with the idea that by keeping straight he was doing me a favor any more than he was doing a favor to his wife, his bishop or to the President of the United States.

The proper rapport having been established between psychiatrist and patient, an analysis is now begun of the subject's entire life situation. I follow a biographical outline and keep a work sheet upon which is recorded the material obtained in each daily interview. These daily interviews last for from one-half to one hour, depending upon the circumstances, and at the conclusion of each it is desirable to formulate and comment briefly or at length (depending upon what has been obtained) upon the material that has been covered. In this way the patient is helped in developing insight into some of the dynamic factors entering into the production of his neurosis.

After two or three weeks of psychiatric interviews the therapist begins to get a pretty fair idea of the personality structure of the patient as well as some of the factors involved in his alcoholism. However, the picture frequently is incomplete and one senses the lack of certain important psychiatric modalities. In order to render these modalities accessible, certain special techniques are requred. Among the most useful of these is the Rorschach experiment. To expound the intricacies and the possibilities of the Rorschach experiment is not within the scope of this paper. Suffice it to say that it is a method of rapid personality analysis based upon the subject's free associations to a series of standardized ink blots. Formulation and interpretation of his responses according to an established technique furnishes the trained investigator with valuable data concerning the patient's inner personality structure, and this data can be put to clinical use. I have used this technique in a number of cases and am convinced of its value.

The next and final stage in the treatment of the problem drinker is reformulation of the material covered, and a synthesis of the personality. In my experience the most useful technique is the use of carefully selected and authenticated reading material. From the voluminous literature on the psychology of alcoholism I have selected three books. The first might be said to be somewhat elementary from a psychological standpoint, the second more advanced, and the third amounts to a textbook on the neuropsychiatry of alcohol. I do not permit my patients to read these books in a perfunctory and

desultory manner. They are required to read each book slowly and carefully and are permitted to read only two or three chapters at a time. They keep notes on what they have read and each day we discuss in close detail the individual assignment. In this way I learn what the patient is getting from his reading, what his attitude is toward the treatment, and how he feels about future drinking. He, in turn, learns many things about himself hitherto unknown, and is helped toward a better integration.

What is a cure? I do not consider a problem drinker cured until his *need* for alcohol is *destroyed*. As long as it requires will power on his part to abstain from drinking, he is not cured. Mere assurances from the patient that he has learned his lesson and is "through forever," no matter how sincerely uttered, are meaningless. I have seen men who *thought* they were cured, yet were dreaming nightly of being on drinking parties. One patient said to me, "Of course, I have absolutely no desire to drink, it does not take a bit of will power to say 'no,' and I have a new lease on life. However, once in a while I think that it might be nice to sit down and have a cold glass of beer but, of course, I never would do such a thing because I know what it would lead to." I warned him that he was in danger. The mere fact that he could play with the idea of taking a drink indicated that the unconscious need still was there. In two weeks this man had a relapse and returned to the hospital.

If the patient has achieved a new state of mind and through it has acquired a new ability to go forward without resorting to alcohol he is cured. If the unconscious desire to drink has been destroyed, if the neurosis has been cured, the drinking problem has been solved. The patient has an increasing sense of physical and mental fitness and a growing enthusiam in each day's accomplishments. The process of having been cured is not to be thought of as a single dramatic step but, as one writer put it, like learning how to swim. Stroke by stroke the patient has followed the doctor and gradually the support has been removed and suddenly the patient discovers the doctor is no longer there and he has the confidence and the ability to go on alone.

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◆ CASE REPORTS ◆

OTITIS MEDIA, LABYRINTHITIS AND MENINGITIS COMPLICATING PREGNANCY: SUCCESSFUL TREATMENT*

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DIFFICULT diagnostic and surgical problems confront the physician and surgeon in the daily practice of their profession. Fortunately for the peace of mind of the surgeon, unusually difficult and trying situations are not frequently encountered. Fortunate indeed is the surgeon who is surrounded by colleagues who, because of their experience and skill in certain branches of medicine, can be called on to help in the management of complicated conditions. I have no illusions about my own lack of knowledge and am always glad to have others express opinions and supervise certain therapeutic methods in the management of all complicated conditions. A case in which such opinions and such methods were available to me will be reported herein.

*From the Section on Otolaryngology and Rhinology, the Mayo Clinic, Rochester, Minnesota. Read before the Middle Section meeting of the American Laryngological, Rhinological and Otological Society, Inc., Chicago, Illinois, January 27, 1941.

REPORT OF A CASE

A married woman, twenty-nine years old, who was five and a half months pregnant, presented herself at the Mayo Clinic complaining of a discharging left ear. Five weeks before her coming to the clinic sudden severe headache and pain over the face had developed. The pain had lasted for two days and had been ascribed to the effect of influenza. Three days after the onset severe otalgia developed on the left, and multiple hemorrhagic blebs on the canal and drum of the ear were observed. Myringotomy was performed soon after the onset of the pain. This procedure failed to relieve the pain. Ten hours later vomiting without nausea occurred. Definite vertigo from the left to the right was complained of, and horizontal nystagmus was observed. Diplopia also was noticed. This syndrome lasted two or three days. Following myringotomy a

profuse sanguineous discharge from the ear occurred. Cultures showed Streptococcus hæmolyticus to be present in the discharge. Mastoid tenderness or fever never had been present. Treatment had consisted of a transfusion of blood because of secondary anemia, and 30 grains (2 gm.) of sulfanilamide administered daily throughout the entire course of the illness. The patient was said to have had, at one time, facial weakness on the left side.

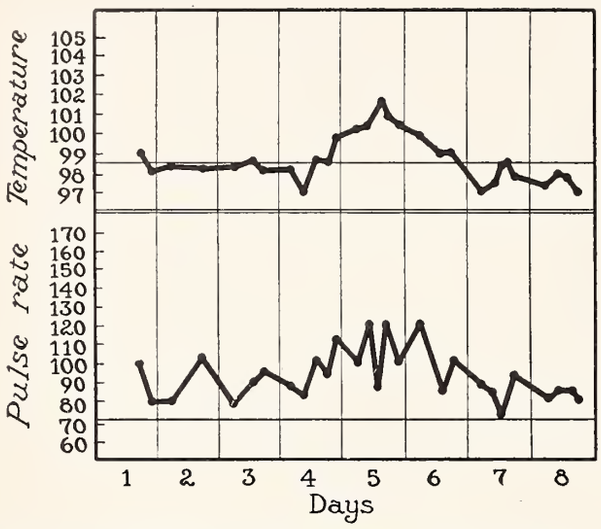


Fig. 1. Clinical chart showing range of temperature (*top*) and pulse rate (*bottom*) for original illness.

Examination revealed that the tonsils had been removed; the pharynx, nasopharynx and nose appeared to be normal. Nystagmus to the right was horizontal in character when the eyes were held in the extreme right lateral position. Results of examination of the right ear were negative. There was a profuse purulent discharge from the left ear; the left ear drum was soggy and red. There was some evidence of drooping of the superior wall of the canal. There was no evidence of mastoid tenderness. Hearing tests revealed marked lowering of perception for the high tones; this lowering of perception was more severe than is usually encountered in the presence of a typical instance of otitis media. Roentgen-ray examination of the mastoid processes revealed the right one to be of the pneumatic type and normal. The left one showed the same type of mastoid cell arrangement as that of the right and all cells were cloudy. There was no definite evidence of destruction. Results of a roentgenogram of the thorax were negative. Examination of the blood revealed the hemoglobin estimation to be around 8.4 gm. per 100 c.c.; erythrocytes numbered 3,000,000 and leukocytes, 8,700, per cubic millimeter, respectively. The patient was found to have blood which was classed in group II. Microscopic examination of the urine revealed some leukocytes.

On the second day of observation, concentric narrowing of the left auditory canal was definite. Copious discharge from the middle ear recurred immediately when previously accumulated discharge was removed from the canal. In fact, there was too much discharge from the ear for it to be accounted for on the basis of infection of the middle ear alone. Again, no mastoid tenderness was elicited.

Two conditions were considered in the making of the diagnosis. It was a question of whether or not the condition originally was herpes zoster oticus, and secondarily, otitis media. We felt very confident that the condition before us at the time was surgical mastoiditis. Because the patient was pregnant, the decision to operate was made with difficulty. However, in consultation with Dr. Faber, the obstetrician, it was decided that there was no contra-indication to operation on the mastoid process.

On the third day of observation operation on the mastoid process was performed. At operation no particular disease of the outer mastoid cells was encountered. As the region of the middle ear was approached, the cells were found to be filled with thickened mucous membrane. Pus was not present. In the region of the tympanic antrum a jelly-like mass of

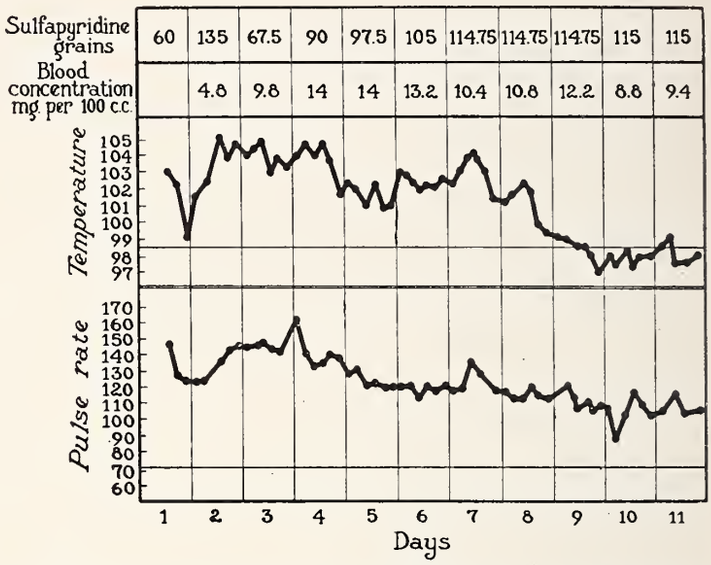


Fig. 2. Chart showing range of temperature (*top*) and pulse rate (*bottom*). At extreme top is the amount of sulfapyridine administered and resultant concentration of the drug in the blood.

plastic exudate was encountered. This extended throughout an irregular cavitation, through to the aditus. The small cells around the capsule of the labyrinth were filled with thickened membrane and when the septums of the cells were removed it appeared that the mucous membrane had been pushed through. This region was carefully dissected out until clean white bone was encountered. The extensive cellular arrangement around the zygoma also was involved by the disease. Evidence of definite disease of the labyrinth was not encountered. After completion of the operation the cavity was washed with the anhydride of 4-nitro-anhydrohydroxymercurioorthocresol (metaphen).

The postoperative convalescence of this patient was entirely normal throughout, as the graphic chart (Fig. 1) shows. The patient was dismissed from the hospital to the care of her otologist at home on the tenth postoperative day. At that time the ear was discharging slightly, but that fact gave no misgivings.

Six weeks later the patient returned to the clinic because severe headache over the vertex had been present for five days. She had noted some unsteadiness in gait. The headache was particularly severe during the early morning hours. For thirty-six hours it had been unbearable. It was associated with nausea and vomiting. On the day of admission the patient had chills and elevation of temperature. There had been no vertigo. There were no unusual symptoms in regard to her pregnancy.

Examination of the cerebrospinal fluid revealed it to be cloudy but on microscopic examination and culture no organism was encountered. The morning after admission the patient was found to have left hemiplegia and Babinski's sign was present on the left. There was no rigidity of the neck. She was definitely comatose. The neurologists felt that in all probability the clinical picture was that of an intracranial lesion, cerebellar in type, with a crus syndrome. Chemotherapy was instituted and supervised by Dr. A. E. Brown.

The situation seemed so desperate that surgical in-

terference did not seem warranted. The relatives were consulted and the question as to whether cesarean section should be done in an effort to save the life of the child was discussed. The husband and parents of the patient decided that cesarean section should be done, and that even though there was little chance of saving the patient's life by any operation on the mastoid process, it was felt that it also should be undertaken.

Cesarean section was performed by Drs. Waugh and Faber. The child was born alive. Following completion of this operation an exploratory operation on the mastoid was performed. Exposure was made as is usual in a radical mastoid operation. Leads to the pyramid were carefully sought for in and around the found. In smoothing up the granulations near the fa- labyrinth and in front of the cochlea. They were not cial ridge a drop of pus was encountered. Exploration of this region revealed suppurative labyrinthitis, with a defect into the anterior end of the horizontal canal, to be present. The labyrinth was then opened up widely, after the method of Neumann. The seventh cranial (facial) nerve was found to be enveloped in a sequestrum of bone. It was very difficult to remove this sequestrum. The patient's face twitched on any manipulation. Removal of the sequestrum was finally accomplished. The dura over the middle fossa down to the angle and the superior petrosal sinus was exposed, and was seen to be as red as the dura over the tegmen of the middle ear. The dura over Troutman's triangle was exposed over the cerebellum. No defect in the dura was encountered and exploration of the cerebellum was thought to be unwise in this stage of the disease. At completion of the operation the wound was packed with a soft rubber drain after the cavity had been swabbed thoroughly with tincture of metaphen.

Before the patient left the operating room table she received a transfusion of 750 c.c. of blood by the citrate method. After being returned to bed, the patient was placed in an oxygen tent. Facial paralysis was noted soon afterward.

On the fourth postoperative day the patient seemed to be somewhat rational and responded to questions. It was found that removal of the patient from the oxygen tent caused severe cyanosis. Oxygen was administered until the sixth postoperative day (Fig. 2). On this day the patient was able to move her left arm and leg freely. Facial paralysis was not complete in the sense that no motion was present, although apparently all the branches of the facial nerve were involved. Following the sixth or seventh postoperative day there was continual improvement in the general condition of the patient. Hemiplegia cleared gradually, and facial palsy remained about the same, although it was never wholly complete. A projectile type of vomiting occurred on several occasions, but it was felt that this was not caused by drugs, but probably by some disturbance within the brain. The patient was discharged from the hospital on the twenty-first postoperative day. The baby had died on the third day of its life. Necropsy revealed that atelectasis of one lung was present.

At the time of the original admission of this patient there was no particularly difficult feature in the composite case, except perhaps that the patient was pregnant. The symptoms suggestive of irritation of the labyrinth had subsided. If the original condition had been caused by herpes zoster oticus the urgent condition was, at the time we encountered the patient, surgical mastoiditis. Deafness was more severe than usual, but the fact that the hearing was not lost completely seemed to suggest strongly that the entire labyrinth was not involved by a suppurative disease. The facts that the operative findings were disappointing and that the discharge from the ear continued were disquieting.

Onset of symptoms suggestive of intracranial extension of the infection occurred rather suddenly in the postoperative course; at a time, in fact, when resolution should have taken place. Curiously enough, the symptoms and signs were not those usually associated with suppuration of the labyrinth. The severe headache and pain were not well localized. The onset of symptoms and signs associated with meningitis, except for rigidity of the neck, was confusing. Cerebellar abscess was suspected. The development of hemiplegia on the same side suggested a lesion involving the crus. Coma made the interpretation and estimation of signs more difficult. The fact that the stage of pregnancy was near term did not make our decision any less difficult. Confronted with the probability that two lives would be lost, we told the relatives of the seriousness of the situation. They were coöperative and decided that operations to save the life of the child and mother should be undertaken, even in the face of such an unfavorable prognosis.

Fortunately, within the last decade, chemotherapy has taken its place in the management of complications resulting from infections of the ear and temporal bone. It would hardly be within the scope of this report to give the details of the course of chemotherapy that was administered in the foregoing case. That, I think, should be done by Dr. A. E. Brown, who so kindly supervised this method of treatment. It is my candid opinion that if chemotherapy had not been used, this patient would not have survived, despite the fact that surgical interference was undertaken. The satisfactory result obtained in this case resulted from the combined efforts of a group of earnest physicians and surgeons.

The patient was seen late in the summer. She had gained greatly in weight and looked to be the picture of health. The condition of the ear was excellent and the facial paralysis had disappeared completely. Thus, it can be said that this patient in the eighth month of pregnancy completely recovered from acute suppurative labyrinthitis, meningitis, and probable encephalitis, secondary to suppurative mastoiditis.

Conclusions

What appears to be an axiom in the management of the complications of suppurative diseases of the ear is that the original focus in the ear or temporal bone must be adequately cared for surgically if the complication is to be combated successfully by adjunct methods of treatment.

It may be safely said that chemotherapy is more effective in combating the extensions of infections to adjacent structures than it is in the treatment of the primary infection in the ear and temporal bone. Chemotherapy cannot be relied upon to cure infection in the ear or temporal bone. It is too likely merely to hold the infection in check; perhaps by reduction of the virulence of the infection. Too much evidence has accumulated to show that symptoms and signs in infection of the mastoid process too often are only masked for reliance to be placed on chemotherapy as a curative method. A false sense of security is as dangerous in surgery as it is in other affairs.

UTERINE FIBROMA INCARCERATED IN A STRANGULATED INGUINAL HERNIA DURING PREGNANCY

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THE incarceration of a uterine fibroid in the contents of a strangulated inguinal hernia is without question a very rare condition. Occurrence of this condition during pregnancy enhances considerably the interest of the investigator. A rather complete review of the literature reveals the rarity of the condition and it is for this reason that the following case is being reported at this time.

Mrs. M. D. a white primipara aged twenty-nine, was first admitted to the Lakeview Memorial Hospital at Stillwater, Minnesota, on February 3, 1936. The history elicited at that time revealed that twenty-four hours prior to admission the patient was seized with a severe coughing attack and at the same time developed a severe, agonizing pain and swelling in the left inguinal region. History also revealed the fact that the patient had entered her fourth month of pregnancy. The pregnancy up to the time of her present illness had been entirely normal. The family history was negative and quite irrelevant.

Physical examination at the time of admission revealed a white female of the stated age who was suffering from severe pain in the left lower quadrant. A hard tender mass about the size of a large hen's egg was palpable in the region of the left inguinal canal. The mass was not reducible. Vaginal examination confirmed the history of a pregnancy of about four months' duration. The patient's temperature was 99, pulse 88 and blood pressure 118/64. The urine was normal and leukocytes numbered 14,200.

A diagnosis of a strangulated left inguinal hernia was made and immediate operation performed. When the hernial sac was opened and explored, a pedunculated uterine fibroid measuring 4x2x2 cm. was found incarcerated in the hernial sac. The fibroid was amputated from the uterus and the serosal surface closed. The hernia was repaired in the usual manner and the patient made an uneventful recovery, being discharged from the hospital on the seventeenth postoperative day.

The patient's pregnancy was carried to a full term completion and a normal delivery and postpartum course followed.

Pathologic diagnosis of fibromyoma was made by Dr. Kano Ikeda on the tissue removed.

DISSECTING ANEURYSM OF THE AORTA: ANTEMORTEM DIAGNOSIS

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SEVERAL dozen cases of dissecting aneurysm of the aorta have been reported as diagnosed ante mortem in recent years, interest having been stimulated in the subject and the clinical picture and course clarified by the many case reports appearing in the literature. The following case is added to this series because of several interesting features which seemed to be explained by autopsy findings, and one of which could not be found in case reports in the literature.

The patient, a ruddy farmer of forty-seven who had fought in the German Army during the World War and had immigrated to the United States in 1923, was seen by the writers in his farm home February 17, 1941. He had been well, except for a cold and some chest discomfort about a week before, until about 3:00 p.m. on February 17, 1941, when he was seized while at a farm sale in a cold wind with a sudden severe pain in the chest. He had come home unassisted where he was seen first lying on a couch, semidelirious and complaining of a severe, sharp tearing pain behind the upper sternum. The relatives stated he walked into the house himself, a grey color, shortly before. One of the writers corroborated this description and found him pulseless and disoriented. When seen by the other writer his color was pink, perspiration was marked, he moved actively on the couch and had to be urged to lie still. The temperature was normal, pulse 54, and blood pressure could not be estimated in either arm. Radial pulse was almost imperceptible, but regular. There was a loud scraping to-and-fro blow over the upper sternum which could be heard down along the thoracic spine. A definite Duroziez sign was noted over the femorals. Dyspnea, cerebral excitement, and anxiety were marked but the ruddy color over all persisted. Because of the aortic type murmur, the absence of cyanosis or pallor, or history of syphilis, and the character of the pain, a tentative diagnosis of dissecting aneurysm of the aorta was made.

An electrocardiogram was done before he was removed by ambulance to the hospital, about one hour after his return home with the pain attack.

On admission to the hospital the blood pressure was about 45 mm. mercury; systolic and the diastolic was indeterminate. His pulse remained around 56 and regular. The severe chest pain persisted just to the left of the sternum and gradually during the next few days, until the patient lost consciousness, migrated from the second interspace to about the third interspace. The loud scraping to-and-fro blow heard at first persisted, loudest over the second interspace close to and over the sternum, but heard over the entire precordium and down along the course of the aorta anteriorly and posteriorly. The confusion and delirium persisted with short periods of rationality. Blood pressure in the right popliteal artery was 150

systolic and 75 diastolic while in the brachials it was 44 over 30 at the same time. No remarkable neurologic signs could be found except the mental state mentioned.

Urine was negative except for albumin 1 plus. Leukocyte count was 19,600 on admission and differential not remarkable. Other counts were 15,000 and 12,500 on ensuing days. Blood serology was reported negative by the State Board of Health. Electrocardiogram done in the home as mentioned above revealed rate of 54, low voltage lead III with predominating Q of 2.5 mm., S-T interval of .36 sec. Repeated in the hospital February 19, 1941, the rate had risen to 90, the low voltage in lead III persisted, the Q was shortened to 2 mm., the R slightly raised over the prior record; the S-T take-off was high but fell sharply, and the S-T interval was .20 sec.

X-ray.—Portable films were taken because of the extreme condition of the patient and revealed a marked widening of the entire mediastinum to the right, with a sharp border throughout in almost a straight line. By fluoroscopy no pulsation could be seen.

Careful cross-examination of his relatives at this point revealed he had had attacks of dizziness in the summer of 1940 and one attack of indefinite chest pain in the fall. As a child he had pneumonia twice in Germany.

Otherwise his course in the hospital was marked by gradual rise of his temperature to 104° rectal the day before death. Oxygen was administered for nine days and markedly relieved his dyspnea. On the fifth day in the hospital his sputum was found to contain great numbers of types 3 and 11 pneumococci which were thought to accompany the increasing congestion of both lungs. Sulfathiazole was exhibited for four days without avail. Pulse rose steadily and rapid auricular fibrillation supervened on his seventh hospital day. Brachial blood pressure fluctuated, systolic reaching as high as 120 and diastolic 70. An expiratory wheeze was noted terminally.

The patient steadily failed and died with severe agonal expulsive effort on his tenth hospital day, dark fluid escaping from his mouth at the moment he expired.

Autopsy.—Only pertinent aspects of the autopsy will be mentioned. General examination was not remarkable. On opening the chest the aorta was found to be widened considerably, measuring 10 cm. at its widest point and the ascending portion was very thin walled, about the consistency of a large vein. The pericardium contained about 100 c.c. of blood, not under pressure. The heart on opening was normal except for marked enlargement of the left auricle. Coronary vessels and valves were intact and normal. There was a circumferential rent in the intima of the aorta about one inch above the aortic ring with a small sector attached anteriorly and a large thin walled sac on the convexity of about 250 c.c. capacity. Dissection had extended as far as the top of the arch and had enveloped the great vessels off the arch, apparently in life having compressed these to some extent, affording a probable explanation of the cerebral symptoms so prominent during the final days of life. Dissection also had extended proximally as far as the aortic ring, leaving a loose flap free in the lumen. Figures 1 and 2 reveal the intima of the aorta torn away at the proximal end from its origin at the aortic ring as described above, leaving the distal segment free in the stream except for the attachment to the arch, the proximal attachment having been divided at autopsy, thus leaving a large sac formed by the adventitia surrounding the "core" of the aorta at this point. Atherosclerosis was minimal.

The right lung was found to be tightly adherent to the chest wall throughout its extent. There was much bronchial exudate.

Microscopic: Sections of the aorta taken in three different locations revealed degeneration of the media in one section to a moderate extent.

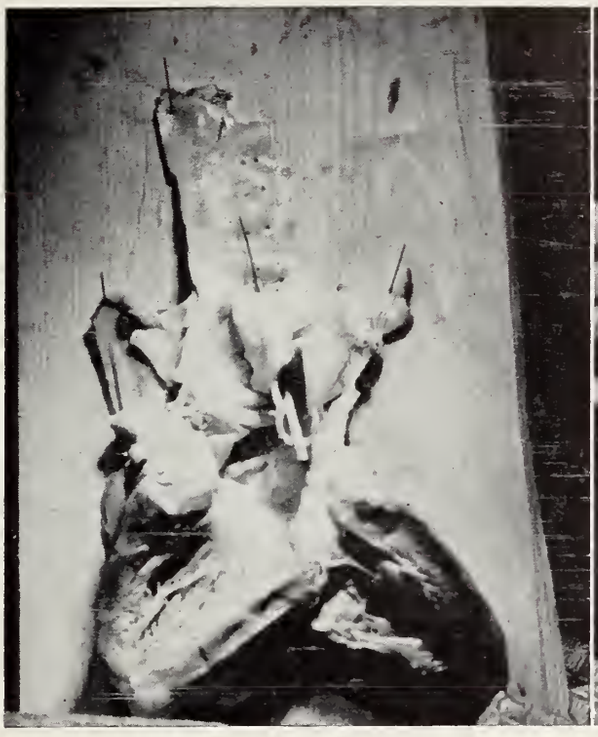


Fig. 1. Specimen opened and with probe through the intimal "core" of aorta showing attachment distally to the arch and the great arteries of the neck still in position as branches of the original aortic lumen.

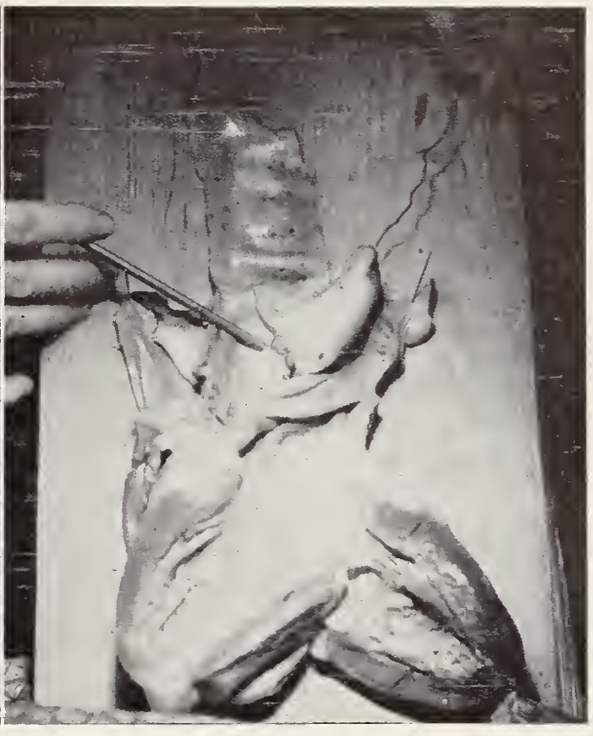


Fig. 2. The "core" pulled aside to show the dissection around the origins of the great neck arteries.

Comment.—In recent years there has been increased interest in these lesions and many new case reports have appeared. Several series of cases have been gathered and the pathology, pathogenesis, symptoms, signs, diagnosis, and even treatment and prognosis have been clarified, although treatment is still expectant and prognosis still bad.

For the purpose of this presentation the clinical picture is of chief interest especially as it ties in with the autopsy findings.

The pain in this case was characteristic but not definitely diagnostic of dissection. It began in about the second interspace left and descended to about the third. It was severe, intractable, unrelated to any circumstance apparently and responded only to heavy doses of morphine. It typically was piercing and felt in the posterior chest. Four of six cases reported by Hamburger and Ferris[1] experienced no pain.

The cerebral symptoms of excitement, restlessness, and anxiety were interesting and in view of the absence of cyanosis and dissection around the origins of the great vessels of the neck, might conceivably be ascribed to cerebral ischemia. The hypotension in both brachial arteries might be explained thus also, as hematuria, intestinal obstruction, hemiplegia, abdominal pain or other symptoms are described by those who have observed at autopsy shearing off or obstruction to vessels along the course of the abdominal aorta. This finding might also explain the relative hypertension in the femoral arteries which was found clinically.

The systolic and diastolic rough murmurs heard over the aortic valves, along the course of the aorta, and in the femorals are explained possibly by deformation of the aortic ring by the dissection proximally under the ring.

The lack of cyanosis except terminally might have been due to collateral superficial circulation to the head and neck.

This case differs from most reported cases in that there was no marked hypertension found, although no estimations made prior to the final illness were obtainable. No cases with hypotension in the upper extremities and a relatively high systolic and diastolic pressure in the lower extremities could be found in the literature out of several dozen reported cases.

Summary

A case of proved dissecting aneurysm of the aorta is presented in which the clinical diagnosis was supported by autopsy findings. A hitherto unmentioned clinical feature, cerebral excitement and hypotension in the upper extremities only, is described and a probable anatomical explanation is offered on the basis of autopsy fininds.

Reference

1. Hamburger, M., Jr., and Ferris, E. B.: Dissecting aneurysm. Am. Heart Jour., 16:1-11, (July) 1938.

UNIDENTIFIED LESION OF THE ANUS AND RECTUM ASSOCIATED WITH CARCINOMA OF THE STOMACH

ANTONIO E. MENDES FERRIERA, M.D.*
Lisbon, Portugal

A MAN, fifty-four years old, came to the clinic of Professor Dr. R. Monjardino at the University Hospital of Lisbon, Portugal, on June 29, 1938, complaining of diarrhea, loss of weight and strength. One uncle and one brother had died of pulmonary tuberculosis. Otherwise the family history was not significant. About one year previous to our examination he began to tire easily and felt little desire or ambition for working. He always passed two stools a day, but in the last year the feces became watery or semisolid, although they did not contain mucus, pus or blood. About one month before admission a physician massaged the anal region with some "ointment for the piles"; the course of treatment lasted twenty-three days. During the last ten days of these massages, when the bowels moved, the patient passed by rectum a large amount of pus and bright red blood.

Three months previous to examination he began to have pain in the anorectal region and at the time of defecation, he had severe pain in the anus extending into the rectum. Previous to the massage the pain was much more severe, but after this treatment he felt pain only during defecation. He did not feel pain or any other abnormal sensation in any other organ or region. He always had a good appetite and used to eat everything without indigestion; however, for the past few months he felt a little fullness and heaviness in the stomach after meals. He made no other complaints referable to the gastro intestinal tract. He had lost 20 kg. during the past six months.

General examination did not reveal anything abnormal. Respirations were twenty-two per minute; the pulse was rhythmic, had good pressure and a rate of 80 beats per minute. The blood pressure was 160 mm. of mercury systolic and 100 mm. diastolic. The temperature was 36.6° C. (97.9° F.).

Inspection of the anus revealed a large external hemorrhoid with an ulcer covering about all of its mesial surface. On digital examination an ulceroproliferative lesion was palpated on the posterior and

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lateral portion of the wall from the anus almost to the rectum. The lesion seemed highly destructive. The rectum was not fixed, there was no obstruction but the wall was thick and hard. The involvement of the anterior wall was much less and in certain parts seemed

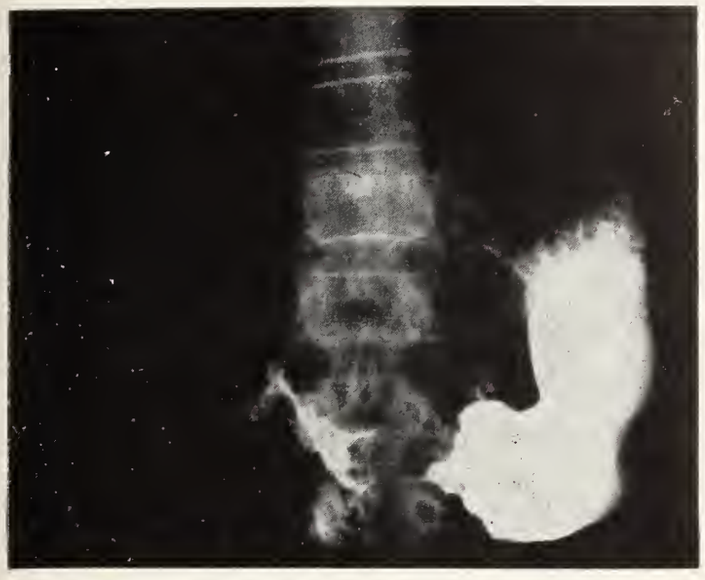


Fig. 1. Filling defect in antrum of stomach.

to be normal. Rectosigmoidoscopic examination of 24 cm. of the bowel above the anus revealed slight edema of the mucosa above the ampulla and in the ampulla itself and the scars of two small elongated ulcers in the posterior wall about 10 cm. above the anus. Below the ampulla, in the entire circumference, but particularly in the posterior and lateral walls, was seen an irregular surface showing many ulcers. These ulcers were elongated, dissecting in all directions, with diameters varying from a few millimeters to 2 cm. They were so numerous that their borders were almost confluent, forming in some places small projections like polyps. The mucosa between the ulcers was small, irregular, red and edematous. The bases of most of the ulcers were red and irregular but in some they were yellowish, gray and wrinkled. Tissue removed for histologic examination from the border of a rectal ulcer and the other from the border of the ulceration in the external hemorrhoid was reported to be "probably reticulosarcoma."

Studies of the morphology and chemistry of the blood made on July 1, gave the following results: coagulation time, six minutes; bleeding time, two minutes; hemoglobin, 78 per cent; erythrocytes, 3,980,000 per cubic millimeter; and the leukocytes, 9,050. On August 3 the value for hemoglobin was 58 per cent and the erythrocyte count was 2,920,000. Successive analyses of the feces were always negative for ova and parasites. Other laboratory tests gave negative results except the analysis of gastric contents after administration of histamine, which revealed complete and true achlorhydria with a total acidity that never exceeded fifteen, and reduced secretion. Roentgenologic study of the stomach and duodenum did not reveal any retention but did reveal a filling defect in the antrum suggestive of carcinoma (Fig. 1). Roentgenograms of the thorax and colon did not reveal any abnormalities.

The patient was given a soft general diet rich in calories and vitamins and supplemented with vitamin medication. For treatment during the first few days in hospital he had only warm rectal irrigations with rivanol, morning and night. On the nineteenth day in

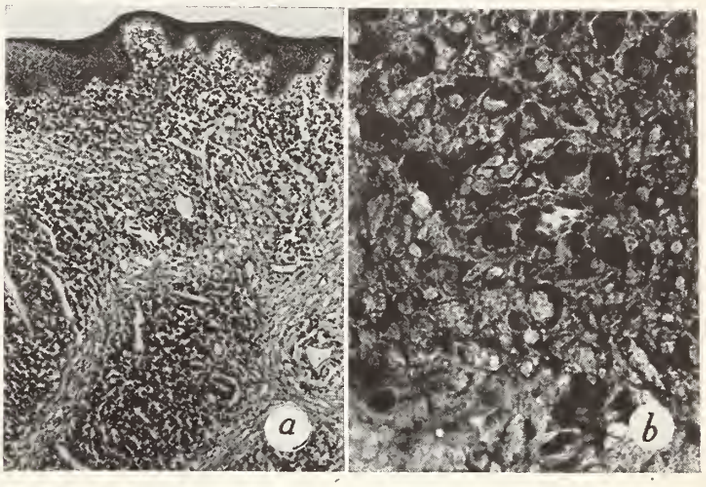


Fig. 2. Tissue from anorectal lesion; *a*, fibrous septa of variable thickness forming a network of spaces containing clusters of cells; *b*, cells forming typical reticulum (hematoxylin and eosin).

the hospital edema of the left foot and malleoli developed and then progressed up to about the middle third of the leg.

Because the edema was thought to be due to metastasis and to pressure on the pelvic veins, roentgen treatment was administered to the two lower abdominal quadrants and two sacral regions, but no improvement was noted. The patient's general condition was more or less unchanged during the next two months, but in October, 1938, he became rapidly worse and on January 25, 1939, he died. Necropsy was not performed.

Pathologic Examination

Tissue removed for biopsy when the patient was in the hospital was fixed in 10 per cent solution of formalin and embedded in paraffin. Serial sections were made and stained with hematoxylin and eosin, Mallory's method, and the Unna-Pappenheim method. Silver impregnation was done by the method of Tibor-Pap. On examination we saw squamous epithelium with a cornified layer and with keratin in spherical formations. These spherical formations were in the parts where the squamous epithelium was not yet keratinized and could be seen only in the spot where there was no keratinization of the superficial layers. The epithelium was thick, it had relatively deep papillæ in some places and thin and small papillæ in others, but generally speaking the papillæ were not deep. Below the epithelium the tissue was made up of fibrous septa rather variable in thickness; some of which were very thick, and contained clusters of cells. The septa anastomosed with each other forming a network of large spaces in which clusters of cells were seen (Fig. 2*a*).

The cells had round and hyperchromatic nuclei and a protoplasm which was faintly stained in some. The chromatin of the nuclei was arranged in fine granules equally distributed, and in some nuclei a small, well

outlined nucleolus could be seen. The protoplasm was rather basophilic. The main characteristic of these cells, however, was the continuity of their protoplasmic projections, which formed a typical reticulum (Fig. 2*b*). The sections stained by the Mallory method confirmed

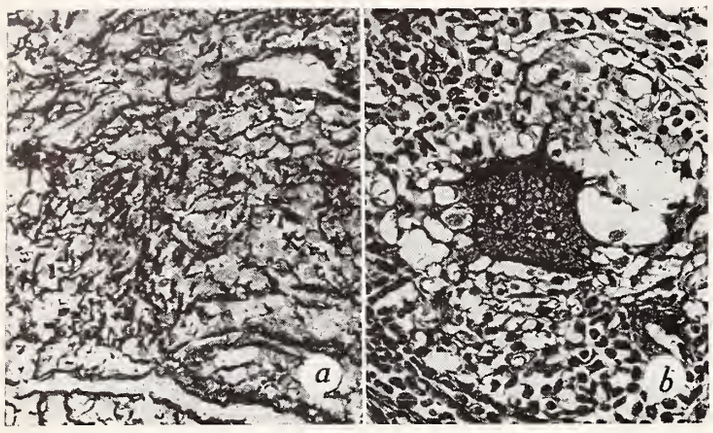


Fig. 3. Tissue from anorectal lesion; *a*, reticulum of fibers (impregnation with silver by Tabor-Pap method); *b*, single giant cell (Mallory's method).

this disposition showing even the insertion of the precollagenic fibers in the walls of the numerous blood vessels that the tissue contained. Impregnation with silver (Tibor-Pap) revealed among the cells many reticular fibers. These fibers extended with the prolongations of the cells which gave to the pictures a histoid aspect (Fig. 3*a*). The cells of the exudate were rare; however, there were a few plasma cells. In one place there was some hemorrhage.

One section stained by the Mallory method revealed one large giant cell of the Langhan's type (Fig. 3*b*). This cell had a reticular protoplasm, was more or less wedge-shaped owing to the existence of numerous protoplasmic projections of the cells close by and contained from fifteen to twenty small, well defined nuclei with prominent nucleoli. The nuclei were arranged side by side around the periphery of one of the hemicircumferences of the cell. Only two of the nuclei were in the interior of the cell.

The histologic appearance of the sections made from the tissue removed from the border of the rectal ulcer was similar, the only difference being, naturally, that instead of a squamous epithelium which is typical of the anal canal, there was columnar epithelium which is characteristic of the rectal lining.

Comment

In this case, from the clinical course it would be impossible to make conjectures about the malignancy or the benignity of the anorectal lesions, and we cannot prove whether or not the gastric tumor was a lesion different from, and independent of, the anorectal lesions. However, a lesion in the stomach of a similar type could not give the roentgenographic picture that we obtained. A picture of this type can be produced only by a polypoid tumor, most probably a carcinoma, and the anorectal lesions are characteristically destructive.

Let me consider then only the anorectal disease. The history is that of ulcerative proctitis or proctosigmoiditis. The rectosigmoidoscopic examination excluded immediately the possibility of the malignant lesions which are commonly found in the anorectal region. On the other hand the ulcers separately and the lesions as a whole were not similar to any of the ulcerative lesions we have seen and which are well described in papers and textbooks. I leave, however, an open point, the ulcerative form of tuberculosis. Primary tuberculosis of the anorectal region is very rare if it exists at all. There was no clinical or roentgenologic evidence of tuberculosis in our case and the proctoscopic appearance of the anorectal lesions did not correspond to descriptions of ulcerative tuberculosis in such a location.

The reason for the impression that this is possibly a tuberculous infection of the anorectal region, is the family history of tuberculosis. To support the impression of tuberculosis we have the fact of having found in one of the sections a giant cell of the Langhan's type, and also the progressively increased relative lymphocytosis in the differential count.

On histologic examination the lesion had an aspect very similar to that of reticulosarcoma, and this would be the final diagnosis if the cells had not been so small and if such a malignant lesion, at least to our knowledge, had been previously described in the anorectal region. The one giant cell we found is not enough to make a histologic diagnosis of tuberculosis, but associated with other factors is undoubtedly one more important link in the diagnosis of the probable tuberculous nature of the lesions. If the lesion had been a reticulosarcoma, the roentgen therapy, if it had not healed the lesions at least temporarily, would certainly have modified them, for reticulosarcomas are radiosensitive. This treatment, however, had no action on the lesions.

The idea that the anorectal lesions in discussion were benign is supported by the therapeutic results obtained in a later somewhat similar case.

SURGICAL TREATMENT OF TUBERCULOSIS

The trend toward surgical treatment of tuberculosis is perhaps the most significant and far-reaching change which has come about in the tuberculosis hospital field. This has involved changes in design and equipment of the hospital, in the organization by the staff, in provision for nursing of surgical cases, and development of closer relations with general hospitals. Wherever the tuberculosis hospital is not prepared to meet the demand for better operating rooms, laboratories, and roentgen ray equipment, the facilities of the general hospital must be utilized.—Editorial, *Penna. Med. Jour.*, March, 1940.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

Frank C. Andrus, Pathologist

SCHILDER'S DISEASE

The case is that of a white male child who died at the age of five years. When he was first seen at the hospital in November, his mother stated that the child had always been bright. He had learned to speak at the age of two years and was walking well when fifteen months old. He was trained for both bowel and bladder at fifteen months. The only illness he had had was whooping cough. Since approximately three weeks before admission the mother had noted a gradual loss in the child's hearing ability, whereas until that time no hearing defects had been noted. Along with this deafness, the child became listless and unresponsive. Moreover, the boy's speech, although always impaired by a lisp, had become considerably more sluggish and more difficult to understand. On one occasion he had refused to get out of bed, preferring to remain there. The child's parents were both living and well. He had a three-year-old brother who was in good health.

Physical examination at the time of admission revealed the following: Temperature was 98 degrees and the pulse 96 per minute. The respiratory rate was 18 per minute. The child was described as being well nourished and well developed. He appeared to be sluggish mentally. The scalp was normal. The pupils reacted to light and accommodation. Ophthalmoscopic examination revealed normal eyegrounds. There was considerable mucopurulent postnasal discharge. The ear drums appeared normal as were the external auditory canals. The throat was negative, but there was an absent gag reflex. The entire throat could be touched with the tongue blade without evoking any gag reflex. Motions of the tongue were normal. The corneal reflex was absent. There was no stiffness of the neck. Examination of the lungs and heart revealed no abnormalities. The abdomen was normal. The Kernig sign was positive. The child stood with his legs far apart and walked with an unsteady gait. The tendon reflexes were as follows: Knee jerks—left three plus, right two plus; ankle jerks—left two plus, right two plus; ankle clonus—present on the left but unsustained, absent on the right; biceps—minus one on the left, minus one on the right; triceps—minus one on the left, minus one on the right; Hoffman's—zero on the left, zero on the right; Babinski—negative bilaterally. Except for the eighth, the cranial nerves were reported as being normal. Laboratory studies were reported as follows: The urine had a specific gravity of 1.017 and was alkaline in reaction. It contained a very faint trace of albumin and a faint trace of sugar. There were no casts, red blood cells, or pus cells. Several other urinalyses were done but none of them showed any albumin or sugar to be present. Hemoglobin was 89 per cent; erythrocyte count was 4,790,000 and the leukocyte count was 8,150. There was a normal distribution. Spinal fluid was examined and was found to be colorless, clear and to contain 25 mg. of protein per cent, 46 mg. of sugar per cent and no cells. Serological tests for syphilis were negative. The Mantoux test was also negative. An encephalogram was made after the introduction of ethylene gas. There was good filling of the ventricles which were not dilated and showed no distortion. None of the gas entered the subarachnoid space.

The patient was lethargic most of the time. At times he did not recognize the doctor—those he had seen before he thought to be strangers. No specific treatment was instituted and the child was discharged to his home for nursing care.

He was again seen in January. During the interval, he had gained slightly in weight and his mother thought that he was somewhat improved. However, he continued to walk very poorly, dragging his left foot and continuing to have a great deal of trouble in hearing. His mother had noted that he was having difficulty in focusing his eyes. He had developed twitching movements of the muscles of his face and arms. Physical examination revealed the same findings as before, except that the Babinski reflex was now positive on the left side. Laboratory examinations were again made but showed no change from the previous time. The child developed periods where he would remain stuporous for as long as forty-eight hours and then gradually regain consciousness. He was seen to lie in bed breathing heavily. There was no spontaneous activity except roving of the eyes with spontaneous horizontal nystagmus. He did not respond to audible or visual stimuli. The pupils reacted to light and the discs were well defined. There was a slight suggestion of edema but no hemorrhages or exudates were seen. The left side of the face and the left extremities were weaker than the right. Occasionally short twitching movements of the right side of the face and the right arm were seen. The child again gradually improved. He took his meals fairly well and was more coöperative and at times he would play with toys which were given him.

He was admitted for the last time to the Pediatric Service the following May. Since his previous hospital

stay he had been practically bed-ridden because of inability to walk. He had become incontinent of both urine and stools. He would lie quietly, exhibiting no spontaneous activity and demonstrated no interest whatsoever in his surroundings. He had developed difficulty in chewing food and also in swallowing. It was the difficulty in swallowing that caused the parents to hospitalize the child again. Examination at this time revealed the patient to be rather markedly emaciated and dehydrated. There was contractures of all four extremities and a waxy flexibility in the arms. The Babinski reactions were now positive on both sides; the knee jerks were hyperactive; and the Hoffman reflexes were now positive. Laboratory examinations were again carried out but they showed no change from those reported earlier. The patient was fed through a nasal catheter which was inserted into the stomach. Shortly after admission his temperature rose to 104 degrees and he continued to have a high fever. Occasionally the child would whine and cry out weakly, otherwise he would lie quietly and would not respond to any but painful stimuli. It became increasingly difficult to maintain the child's nutrition, poor though it was, and death came approximately eight months after the onset of the illness. Clinical diagnosis: Encephalitis periaxialis diffusa (Schilder's disease).

Autopsy Findings

Dr. Harold Freedman: The body was that of a very poorly developed and emaciated white child. The left hand was hyperextended at the wrist and both feet were plantar flexed. The peritoneal cavities and the abdominal organs appeared to be entirely normal. The heart was normal; the lungs were somewhat increased in weight and they showed patchy areas of consolidation in the hypostatic areas. No abnormalities were noted in the genito-urinary tract. There were no enlarged lymph nodes. Examination of the head revealed a normal scalp and skull. The meninges were all normal. There was perhaps a slight increase in the amount of cerebrospinal fluid in the subarachnoid space. External examination of the brain revealed no particular gross abnormalities except in the occipital lobes. Here there was a marked narrowing of the convolutions to approximately one-half of their normal size and this narrowing was almost completely restricted to the occipital lobes. On palpating the brain, the occipital lobes were found to be much firmer than the remainder. They had a rubbery, hard firmness. Sagittal section through the brain revealed gross cystic degeneration of the splenium of the corpus callosum. Coronal sections showed the white substance to be replaced by patchy areas of induration which radiated out toward the convolutions but never extended into the cortex. These areas were also grossly visible, having a more grayish appearance. Anatomic diagnosis: (1) Schilder's disease; (2) bronchopneumonia.

Discussion

Dr. Frank Andrus: Microscopic sections reveal numerous large areas of demyelinization and gliosis in the subcortical white matter of the cerebrum. In many areas phagocytic cells containing lipoid are present. There is an infiltration of lymphocytes in the adventitia of many of the small blood vessels. Nowhere is there any exudative inflammatory reaction. The cortical portions of the brain are not in any way involved. Schilder's disease is not a true encephalitis. We find no real evidence of inflammation. It derives the term "periaxalis" because it involves primarily the medullary sheath leaving the axis cylinder at first unaffected.

Dr. Milton Hurwitz: This condition was first described by Schilder in 1912, but it was not until 1924 that the syndrome first appeared in the American literature. At first the diagnosis was made primarily by a process of exclusion but we have learned from the cases reported that in spite of the variety of symptoms and the variable order in which they appear, there are certain features which form a basis for the clinical diagnosis. In 1930, Gasul collected seventy-one cases which had been reported up to 1929 and found that it was primarily a disease of children and adolescents, over one-half of the cases occurring before fourteen years of age and over one-third before the age of twenty-five years. In five instances, however, the patients were over forty-five years of age. Twice as many males are affected as females. The onset may be either acute or gradual. The duration of the disease from the onset of the symptoms until the time of death may be as short as a few days to as long as thirteen years. Although the disease is considered fatal, instances of recovery with permanent defect have been reported. Most of the cases seem to appear sporadically, yet in some there appears to be familial tendency, eight of thirteen children being affected in a family reported by Symonds, though not all of those were established as being Schilder's disease. The condition seems to be similar to a congenital demyelinating disease of lambs known as "swayback." The chief early clinical sign is cerebral blindness which becomes complete, to which is added mental reduction and increasing spastic paralysis. Unsteadiness from parietal involvement and deafness from temporal involvement may be conspicuous. The dementia increases and passes into coma which terminates the illness. The condition, usually bilateral, may commence on one side only and be confined to one side. In our case, the first sign was progressive deafness and at no time was blindness an outstanding symptom. Visual disturbances seem to be more prominent in the older patients and may appear in the form of misty vision, scotomata, diplopia, hemianopia, or even acute blindness. In the younger patient, the most frequent early symptoms are convulsions and disorders of gait; psychic disorders of any kind occur in almost all patients—the most frequent are forgetfulness, dullness, irritability, confusion, euphoria, disorientation, etc. The motor symptoms, of course, depend entirely upon the extent and location of the cerebral involvement. In practically all instances a typical upper motor neurone lesion syndrome is encountered. Paralysis is usually progressive and first manifests itself as a paresis. Quadriplegia is common and the spasticity may become so severe that the patient lies in complete opisthotonos with contractures of both arms and legs. The atrophy of the muscles is usually not marked. The temperature is usually normal in this disease until intercurrent infection supervenes. The disease must be thought of, especially in children, when the following triad of symptoms are found: progressive loss of vision of a cerebral type; progressive spastic paralysis; and progressive dementia. The etiology of the disease is entirely unknown. It is probably related to other demyelinating diseases such as disseminated sclerosis. No treatment has been found to be effective in arresting the course of the malady.

HOMEOPATHIC AND ECLECTIC MEDICINE IN MINNESOTA*

By James Eckman

Rochester, Minnesota

(Continued from September issue)

Certain Homeopathic and Eclectic Pioneers

Adolphus Fitz Elliot (1836-1901) was an eclectic physician whose name is perpetuated today in the Elliot Memorial Hospital of the University of Minnesota in Minneapolis, toward the erection of which $114,000 was bequeathed by Dr. Elliot's widow in 1911. Dr. Elliot was born in Corinna, Maine, came to Minneapolis in 1855, and served in the Third Minnesota Infantry Regiment during the War of the Rebellion. Hamilton[31] said that in the *Minneapolis Daily Tribune* of May 29, 1867, the professional card of J. S. Elliot and A. F. Elliot appeared, with the announcement that A. F. Elliot "embalms the dead." Dr. Elliot was one of the founders of the old Minnesota Academy of Natural Sciences, which he served as secretary and curator in 1876 and as president some years later, and to which he gave many specimens of mineral, rock, fossils and flora of Minnesota. In 1869, at Owatonna, he helped to found the Minnesota State Eclectic Medical Society. He apparently was the inventor of a nasal douche for use in treatment of diphtheria and infections of the throat and nasal passages. He presented this douche to the Minnesota State Eclectic Medical Society at that group's fifteenth annual session at Owatonna in May, 1883.[65] He was a member of that society's first board of censors.[48] He died in Minneapolis on April 26, 1901.

Not much is known about **Dr. Trevanion N. Berlin** (1823-1911). He was living in Farmington in 1867; he came to Saint Paul in February of that year to assist in the organization of the Minnesota State Homœopathic Institute.[6] He was the inventor of "Berlin's Hydrastis Uterine Supporter; A Treatment for Ulceration of the Womb, Prolapsus, and all Varieties of Female Weakness." This appliance was sold by the well-known homeopathic pharmacist, Thomas Gardiner, at his pharmacy at 306 Nicollet Avenue in Minneapolis. It was described in the *Minnesota Medical Mirror*[82] as follows: "This is a novel invention and a new method of medication. It is a cup-shaped ring of wax which dissolves slowly. Extract is incorporated into the instrument which theoretically meets the requirement for a constant anodyne and tonic application to an irritable os, while at the same time it is a brace against a descending uterus." Dr. Berlin was still living in Farmington in 1882, but by 1887 he had moved to Minneapolis. It is not probable that he was graduated from a medical college. He was licensed to practice medicine in Minnesota by exemption on November 27, 1883.[83] In about 1895 he moved from Minneapolis to the state of Washington, and he died at Kent in that state on June 16, 1911, at the age of eighty-eight years.[84]

Armstrong[56] has contributed a provocative piece of information in the revelation that one **Dr. George Hadfield,** a homeopathic physician, came to Saint Paul in August, 1854.[75] Armstrong has traced out the curious career of Hadfield insofar as available evidence permitted, and has shown that this early homeopath not only had an office in Saint Paul, but also edited and published a strange little journal called the *Minnesota Homœopath,* of which only one copy, now in possession of the Minnesota Historical Society, is known to exist.[56] It probably could be suggested that this diminutive publication was the first medical journal to be published in Minnesota. Hadfield, in 1858, had an office on "4th Street between Fort and Exchange."[85] It is thought that Dr. Hadfield died in Cincinnati after 1870.

Dr. Hadfield was not, however, the first homeopath to come to Saint Paul. Practitioners of the system themselves considered **Dr. George S. Sperry** of New York to be the first of their kind in Saint Paul.[6] Armstrong[75] wrote that Dr. Sperry was in Saint Paul in 1853, and that he served as medical examiner for the New England Mutual Life Insurance Company. Homeopaths[6] claimed that he was in Saint Paul in 1852. In August, 1854, Dr. Sperry had an office on Third Street in Saint Paul, opposite C. E. Mayo & Company, and he lived at the Winslow House.[75] His professional card was still being published in the Saint Paul *Pioneer* at the end of 1854, and he remained in that city for four more years.[75] He left town in 1859 because of some local scrape in which he had become involved.[75] When the census of 1857 was taken in Minnesota Territory for the purpose of determination of Congressional districts in the event the Territory became a state, Dr. Sperry's age was given as fifty years.[86] If this figure was correct, the year of Sperry's birth would be 1807. He apparently was born in the state of New York.

Homeopaths[6] also maintained that **Dr. Z. B. Nichols** settled in Saint Paul in 1852, and that he went to Northfield in 1853. He later became physician to the Minnesota State Institution for the Education of the Deaf, Dumb and Blind which was opened in 1863 at Faribault. He was elected president of the Minnesota State Homœopathic Institute in 1873, and in 1882 was reported to be practicing in Portland, Oregon.[6]

Dr. A. E. Boyd (or "E. A. Boyd," as he is called in the *Transactions* of the Minnesota State Homœopathic Institute) was born in Maine in 1817. He came to Saint Paul in 1854, and remained there for a few years, later moving to a farm in New Canada Township in Ramsey County. He was one of the founders of the Minnesota State Homœopathic Institute in 1867, and later served as treasurer of that body. Once he was expelled from the institute for refusal to turn in the requisite reports and moneys, but he was made an honorary member of the institute in 1887. Armstrong remarked that Dr. Boyd died on June 4, 1888.[75] He was said to have known Dr. Hadfield. In 1870 Boyd received the degree of Doctor of Medicine from the Minnesota State Homœopathic Institute.

Dr. Heinrich Alexander Leopold von Wedelstaedt (1817-1900) was born in East Prussia, Germany, and was graduated in "regular" medicine from the University of Koenigsburg at the age of nineteen years.[87] His early life and adventures seem so amazing that it is doubtful if many other early day Minnesota physicians were exposed to such harrowing and exciting circumstances

during their careers. It was said[88] that Dr. Von Wedelstaedt's father was a circuit judge in Prussia, and that he was accustomed to journey from one town to the next, in the course of his duties, in "a gorgeous equipage with his hounds and outriders with trumpets." The Von Wedelstaedt estate was adjacent to that of Prince Otto Eduard Leopold Bismarck-Schoenhausen (1815-1898), and the Prince's mother was young Von Wedelstaedt's godmother.[88] Heinrich von Wedelstaedt and the young prince were playmates, and when Dr. Von Wedelstaedt was married, years later, he named one of his sons after the Iron Chancellor.[87] It is probable, but not certain, that young Von Wedelstaedt left Germany during the Revolution of 1848, which sent so many of his countrymen to the United States. He shipped on a sailing vessel for America, and took most of his considerable fortune with him. The ship was wrecked off the coast of Cuba, and it sank with the young man's money and personal effects. He managed to reach the shore, and for the next few years supported himself by preaching in the Lutheran Church, to the ministry of which he had been admitted in Germany. His son, Dr. Bismarck von Wedelstaedt,[87] informed the author that his father studied medicine in New York and other Eastern cities for a while, and then ventured westward. In Kentucky, he met and married Miss Elizabeth LeFebvre, who was said[87, 88] to have been the daughter of Pierre François Joseph LeFebvre (1755-1820), Duke of Danzig and Marshal of France. Dr. Von Wedelstaedt spent some time in the city of Cincinnati, where he became acquainted with Dr. Joseph H. Pulte,[9] who founded the Pulte Medical College (homeopathic) of Cincinnati, as previously noted. In 1857, Dr. and Mrs. Von Wedelstaedt came to Saint Paul, possibly at the instance of Dr. George Hadfield[56] and Dr. Pulte.[56] Armstrong[56] said that Dr. Von Wedelstaedt's professional card appeared in the Saint Paul *Pioneer* and *Democrat* in November of 1857. He appears to have been a substantial and much respected citizen, and his general popularity no doubt was enhanced by the fact that he could speak English, French, German, Spanish and Italian fluently.[87] One of his sons[88] said that he was a master of no less than thirteen languages. In 1863 he lived at Wacouta and Tenth Streets in Saint Paul, and maintained an office on Third Street between Minnesota and Robert Streets. He was an officer of Saint Paul Lodge No. 3 of the Masons, and served as one member of a committee of three physicians which on February 14, 1867, drafted the articles of association of the Minnesota State Homœopathic Institute at the old Globe Hotel in Saint Paul.[6] He also served as recording secretary of the convention which established the institute.[6] He was elected secretary-treasurer of the institute in 1871, 1872 and 1873, and was elevated to the presidency of that body in 1874.

Thomas McLean Newson[89] (1827-1893), who came to Saint Paul in 1858, and presumably knew Dr. Von Wedelstaedt, wrote a pleasant sketch of him in 1886:

> Dr. H. A. L. Wedelstaedt is a tall man, of quick motion, and a great admirer of secret organizations. He came to Saint Paul in 1857 and carried on the profession of a homeopathic physician up to 1877, or twenty years, when he removed to Deadwood, where he now is. He is a good physician, sociable in his nature, very fond of display, and is well remembered by the older residents of the city. He has a fine family, and his oldest son is now in business in this city.

Vedder,[32] who apparently reproduced Newson's estimation of Dr. Von Wedelstaedt almost word for word, repeated Newson's assertion that the pioneer physician left Saint Paul for Deadwood in 1877. Dr. J. F. D. Cook,[90] secretary of the South Dakota State Board of Health, reported that Dr. Von Wedelstaedt

was licensed to practice medicine in the Territory of Dakota on August 1, 1887, and that Dr. Von Wedelstaedt told the examining officers he had been awarded the degree of Doctor of Medicine by the Minnesota State Homœopathic Institute in 1867. Dr. Von Wedelstaedt's name did not appear in the "Directory of Homœopathic Physicians of Dakota" which was published on page xi of the advertising section of the old *Minnesota Medical Monthly* for May of 1887 (volume 2, number 1), but it was announced within this directory that the list of names was not complete. Dr. Bismarck von Wedelstaedt[87] of Long Beach, California, who generously supplied the author with much valuable information concerning his father, wrote: "He was attracted to Deadwood, South Dakota, became interested in mining activities, and as there was a scarcity of physicians, he carried on quite a practice in that locality. He made frequent trips to Saint Paul for medical consultation and visits with his family." Another son, Dr. George S. von Wedelstaedt[88] of Hollywood, California, said that his father "was the discoverer of the cause of trichina in the human body, and was given due credit for this at the time," and that the elder man was the personal physician and warm friend of Governor Alexander Ramsey (1815-1903) and Archbishop John Ireland (1838-1918).

Dr. Heinrich A. L. von Wedelstaedt died in Deadwood, South Dakota, on March 19, 1900, and as if in commemoration of a life replete with adventure and incident, he was buried in Mount Moriah Cemetery in Deadwood, not far from the grave of the redoubtable James Butler ("Wild Bill") Hickok (1837-1876), famous Union spy of the War of the Rebellion, overland stage driver, and border marshal, who was murdered in Deadwood on August 2, 1876, by a ruffian named Jack McCall.

Dr. William Caine (1819-1867) was said to have settled in Saint Paul in the summer of 1857.[91] He was born on the Isle of Man on August 1, 1819, and came to the United States at an early age. He was graduated from the Medical Institution of Geneva at Geneva, New York (now the University of Syracuse College of Medicine at Syracuse), in 1842, and practiced as a "regular" physician until he ventured west to Cleveland, Ohio, where he entered the old Western College of Homœopathic Medicine, which had been organized in 1849.[91] Dr. Caine was graduated from this college in 1852, and after practicing homeopathy for five years at Ravenna, Ohio, where his son was born, he removed to the Territory of Minnesota.[91] Armstrong[86] wrote that Dr. Caine's professional card appeared in the Saint Paul *Pioneer* on January 4, 1859, and that in 1862 Dr. Caine offered $25 for five Indian[92] scalps, no doubt because he was incensed by the great Sioux uprising of that year in Western Minnesota. It was said that Dr. Caine served two terms as city physician of Saint Paul and and county physician of Ramsey County,[91] and that **Dr. Charles Draper Williams** (1812-1882), a homeopathic physician from Cleveland, Ohio, was his partner from 1861 to 1864.[86] He earned $900 in practice in Saint Paul in 1866.[3] In 1867 Dr. Caine was living at Stillwater, and in February of that year he became one of the founders of the Minnesota State Homœopathic Institute.[6] He died on June 19, 1867, of "sunstroke."[91]

Dr. Caine had a son, **Dr. William Harris Caine** (1854-1902), who was born in Ravenna, Ohio, on May 10, 1854.[83] He came to Minnesota in 1860, and was graduated from the old Hahnemann Medical College and Hospital of Chicago in 1877. He established a homeopathic hospital in Stillwater on March 27, 1881,[44] as has been shown, and was licensed to practice medicine in Minne-

sota on October 23, 1883.[83] He seems to have been a rather successful if somewhat turbulent physician. He was county physician of Washington County in 1881, and he was also surgeon for the Chicago, Milwaukee and Saint Paul Railway Company.[93] In 1883 he was elected a censor of the Minnesota State Homœopathic Institute, and in 1885 he was a delegate to the annual convention of the American Institute of Homœopathy.[93] In an era in which veteran soldiers of the War of the Rebellion were highly esteemed, he was elected (1885) secretary of the Association of Sergeants of the First Minnesota Infantry Regiment. He also achieved at least a measure of fame in the fact that in about 1881 he discovered a true leper in Washington County.[93] Dr. Caine came to grief in Stillwater in 1881, when he was excluded from practice in the Stillwater City Hospital "for conduct unbecoming a physician and a gentleman."[45] But Dr. Caine apparently was not one to be thus deterred: he threatened to sue the managers of the hospital, and was promptly re-admitted to practice therein. At his death, which occurred on September 16, 1902, he was living at 901 Chicago Avenue in Minneapolis. The certificate of his death was signed by Dr. Alonzo Potter Williamson (1854-1920), at that time dean of the University of Minnesota College of Homœopathic Medicine and Surgery.[83]

Dr. William Harris Caine also had a son, **Dr. Arthur T. Caine** (1875-1935), who was born in Saint Paul and was graduated from the University of Minnesota College of Homœopathic Medicine and Surgery in 1899. In 1921 he became superintendent of the Anoka State Asylum. He died in Minneapolis on September 12, 1935.[94]

Dr. Charles Draper Williams (1812-1882) came to Saint Paul in 1861,[86] and entered into partnership with Dr. William Caine (1819-1867); in 1862 the two physicians served jointly as physicians of Ramsey County. They severed partnership in 1864. It was said that Dr. Williams had been one of the founders of the Cleveland Homœopathic Medical College in 1849, and that he had been professor of the theory and practice of medicine in that institution.[91] Homeopaths said that his introductory address at the start of his first course of lectures at the college in 1850 was the first oration on the subject of homeopathy ever delivered in Cleveland.[91] Dr. Williams was not by training a homeopath. He had been graduated as a "regular" physician from the Fairfield Medical College in Herkimer County, New York, in 1835, and did not embrace homeopathic practice until 1840. In 1865, according to Armstrong,[3] Williams became president of the Vermillion Falls Gold Mining Company of Saint Paul, and signed his name as "C. Draper Williams." He was one of the founders of the Minnesota State Homœopathic Institute[6] and in 1868 was president of the institute. He was the first treasurer of the old Ramsey County Homœopathic Medical Society, which was founded in Saint Paul in February, 1872.[32] Armstrong[3] unearthed the fact that Dr. Williams made $1,535 during 1866, and that he made $1,479 for the year ending May 1, 1867. Such incomes probably were excellent in point of buying-power in Saint Paul in the sixties.

According to Dr. Williams' own statement, he at one time conducted experiments on Alexis St. Martin (1800?-1880), after Dr. William Beaumont (1785-1853) had died and had left St. Martin to shift for himself. In 1868 Dr. Williams, in an address called "Consumption of the Lungs,"[95] observed:

> Experiments made by Prof. Jehu Brainerd and myself before the class of the Western College of Homœopathy, at Cleveland, Ohio, in 1855, on the famous Alexis St. Martin, demonstrated that whenever the branches of the pneumogastric nerve were irritated in the

stomach, he invariably coughed vehemently, referred the irritation not to the point where it was made in the stomach, but to the root of the lungs; the exact point where the joining by the plexuses of these nerves by the sympathetic occurs; showing beyond doubt the transmission of irritating agencies through these organs, and their arrest at the point where tubercles first make their appearance, and where they are most destructive.

Dr. Williams died in Saint Paul on May 7, 1882.

Dr. Thomas Chatterton Schell (1823-1882) probably had no great ability as a physician, but he assuredly was a man of intensely interesting character. He was born in England in 1823, and Vedder[32] said that he had been educated in England at a branch of King's College. He came to America in 1836, and began the study of medicine with Dr. D. W. Mathews of Rochester, New York. Four years later he became partner to Dr. Mathews, and remained so for two years, at the end of which he removed to Detroit, Michigan, to practice there for a year. Geneseo, New York, was the next town in which he settled, and he spent three years there. He was then appointed to be physician to the Marine Hospital in the Sandwich Islands, a post he occupied for two years. Leaving the marine service, he returned to America to settle in Lockport, New York, but soon went to New York City. He came to Saint Paul in 1859, according to Armstrong.[86]

"Doctor Schell was not a man of great ability," Armstrong[96] wrote, "but soon established a large practice. He was very fond of the good things of life. He got drunk regularly every day at one o'clock and told his patients so, advising them to call him in the morning as he could not make calls in the afternoon."

Dr. Schell made $959 in 1866,[3] and in the same year seems miraculously to have escaped disaster. Early in the year, it was written,[3] the old Cosmopolitan Hotel at Third and Franklin Streets in Saint Paul was attacked by fire, only the gutted stone walls remaining upright. On June 25, 1866, a terrific wind toppled the crumbling walls and part of them crashed down on the roof of Dr. Schell's home. "It was feared that the doctor was killed, but those who started to clear away the ruins were encouraged by a flood of expletives in his well-known voice. When he was extricated, it was found that his left leg had sustained a compound fracture which confined him to bed for some months."[3]

Dr. Schell was one of the founders of the Minnesota State Homœopathic Institute in 1867, and was the first president of the Ramsey County Homœopathic Medical Society, organized in February of 1872. He died on September 2, 1882.[97]

It is interesting to notice that at least two pioneer homeopathic physicians were medical editors before they came to Minnesota. One of them died in Saint Paul. **Dr. A. P. Skeels** (1829-1872) was graduated from the Homœopathic Medical College of Pennsylvania (now the Hahnemann Medical College and Hospital of Philadelphia) in 1867, and went west to Saint Louis in 1868, where he became professor of materia medica in the old Homœopathic Medical College of Missouri. It was while he was in Saint Louis that Dr. Skeels served as editor of the *Western Homœopathic Observer*. He came to Northfield, Minnesota, in January of 1870, suffering from pulmonary tuberculosis, and he died at Northfield on May 16, 1872.[91] Dr. Skeels was said by Vedder[32] to have been the preceptor of **Henry Hutchinson** (1849-1910) of Saint Paul, who was born in Montreal on August 20, 1849, and came to Northfield, Minnesota, with his parents in 1858. Dr. Hutchinson was graduated from Carleton College, and from the Hahnemann Medical College and Hospital of Philadelphia in 1874. He

came to Saint Paul in 1878 and was appointed to the Minnesota State Board of Health and Vital Statistics in January, 1895, became vice president of the board in 1896, and president of it in April, 1904. He was still president of the board when he died in Algiers on December 1, 1910.[98] It is logical to suggest that Dr. Skeels not only schooled young Hutchinson in the principles of homeopathy at Northfield, but also persuaded him to go to the Hahnemann Medical College and Hospital of Philadelphia, from which Skeels himself had been graduated.

Dr. James T. Alley (1831-1878) was born near Poughkeepsie, New York, on March 30, 1831, and attended the University of the City of New York Medical Department, from which he was graduated in 1854.[91] At graduation Dr. Alley was a so-called allopathic physician, and he remained so for about two years thereafter. In 1856, however, he became a homeopath, and from that year until 1864 he "was one of the associate editors and leading contributor to both the *North American Journal of Homœopathy* and the *U. S. Journal of Homœopathy,* besides writing much for other journals."[91] In his obituary[91] it was said that Dr. Alley came to Saint Paul in 1867, but Armstrong[3] wrote that he settled in that city in 1866. He was suffering from pulmonary tuberculosis when he reached Minnesota, and he died in Saint Paul on September 17, 1878, of that disease.[91]

Dr. Eli Morton Morehouse (1835-1891) was born in Warren, Ohio, on March 2, 1835, and was graduated from the old American College of Medicine and Pennsylvania Eclectic Medical College of Philadelphia (later the Philadelphia University of Medicine and Surgery) in 1853.[99] He came to Owatonna in 1855. He was one of the founders of the Minnesota State Eclectic Medical Society at Owatonna on May 26, 1869,[48] and may even himself have sent out the call for the meeting which was to found this society. He was elected first president of the society, and no doubt also belonged to the Southern Minnesota Eclectic Medical Society, founded on November 14, 1869.[48] Dr. Morehouse was a member of the Minnesota State Senate in 1878. He died in Owatonna on May 23, 1891.[99]

Dr. Staunton B. Kendall (1808-1897) was born at Rutland, Vermont, on March 17, 1808.[100] When he was about twenty years old his family moved to Canton, Pennsylvania, where the young man succeeded in obtaining a medical education, probably under a preceptor. In the year 1856 he came to what is now Dodge Center, Minnesota, where he settled on land which he obtained from the United States Government. He sold this land in 1862 and in about 1865 removed to Byron, Minnesota, where he remained until his death. Leonard[101] said he built the first hotel in Byron. His granddaughter, Miss Aurilla Kendall,[100] has reported that Dr. Kendall's practice embraced a region of about thirty miles in radius, and that he often called Dr. William Worrall Mayo (1819-1911) into consultation after Dr. Mayo had settled in Rochester. Miss Kendall[100] wrote that her grandfather dispensed his own drugs in the village store owned by his son (Miss Kendall's father), and that "the older settlers say that they could get prescriptions filled in Byron when they couldn't get them in Rochester." Miss Kendall doubted that her grandfather had been graduated from a medical college. On May 14, 1872, at the second annual session of the Southern Minnsota Homœopathic Medical Society at Owatonna, Dr. Kendall was elected a member of the group.[6] He was licensed to practice medicine in Minnesota by exemp-

tion on November 28, 1883.[83] He died at Byron on November 9, 1897, and is buried at the cemetery in that village.

Dr. Wilson Adolphus Allen (1834-1934) was born in Pendleton, Indiana, on March 6, 1834, and settled in Plainview, Minnesota, in 1865. He had studied medicine under a preceptor in Indiana, and settled in Rochester in 1872. He was elected to membership in the Southern Minnesota Homœopathic Medical Society on May 14, 1872.[6] In 1879, Dr. Allen was graduated from the Hahnemann Medical College and Hospital of Chicago, and in 1883 he completed a post-graduate course of study at that institution. He was made a member of the Minnesota State Homœopathic Institute and he also joined the American Institute of Homœopathy. Dr. Allen, according to Leonard,[102] was particularly ingenious as an inventor, and was elected a member of the Academy of Inventors of France. When in the nineties in Rochester the Riverside Hospital was organized by certain clergymen and homeopathic physicians, Dr. Allen gave ardent support to the new venture, which came to a disastrous end when "A famous homeopathic surgeon was imported from a neighboring city to operate. His work was very unsuccessful, and, the confidence of the community being shaken, patients were not forthcoming, and the Riverside Hospital died a gradual death."[103] Dr. Allen was elected mayor of Rochester in 1895, and lived to the incredible age of 100 years. In later years he was a member of the Minnesota State Medical Association. He died in Rochester on May 11, 1934, death occurring after he had sustained a severe fall to the ground.[104] *The Saint Paul Pioneer Press* in its issue of July 20, 1930, published a feature story concerning Dr. Allen's life and career, written by Kathryn Gorman.

Dr. J. M. (or I. M.) **Westfall** (1821-1888) came to Rochester from Lafayette, Indiana, in 1860, as a Universalist minister.[105] He preached at Rochester, Mantorville, Cascade and Spring Valley for a number of years, and then began to practice homeopathic medicine and to farm. It is not known that he was a graduate of a medical college or that he had undergone training in medicine. Leonard[105] said that he was something of a political figure in Olmsted County, and that he was a member of the Anti-Monopolist Party. He was elected first president of the Southern Minnesota Homœopathic Medical Society, which was organized at Owatonna in October, 1871,[6] but he did not remain in Minnesota for many years. On July 7, 1887, Dr. Westfall was examined at Miller, in what is now South Dakota, for a license to practice medicine in the Territory of Dakota, and it is recorded that such a license was issued to him on July 16, 1887.[63] At that time he was living in Watertown. He was apparently a member of the Dakota Homœopathic Medical Association, for his name appeared in the "Directory of Homœopathic Physicians of Dakota" which was published on page xi of the advertising section of the *Minnesota Medical Monthly* for May, 1887 (volume 2, number 1). This directory was inserted by the aforementioned association. Dr. H. A. Tarbell,[106] of Watertown, South Dakota, who kindly sent the author data concerning Dr. Westfall, wrote that Westfall seems to have practiced homeopathy to a limited extent in and about Watertown, and that he died on December 29, 1888, in Watertown. His wife, Amanda Westfall, died in Watertown on January 12, 1888. A son, Murray Westfall, died in 1917.

Dr. William H. Woods (1823-1903) was born in Ohio in 1823, the son of William W. and Elizabeth Holmes Woods, who came to Ohio from Pennsylvania.[107] Neill[108] said that Woods was graduated from a college in Euclid, Ohio,

and that he came to Minnesota in 1856. He settled in Madelia in 1868, and began the practice of medicine at once, although it is not clear that he was ever graduated from a medical college. He was licensed to practice in Minnesota by exemption, on November 27, 1883.[107] Neill[108] wrote that Dr. Woods was exceedingly proud of the fact that he had obtained six teeth from the jaws of the celebrated bandit, James Younger (1848-1902), when the Younger brothers were captured in Southern Minnesota, but Dr. Woods apparently was not attending physician to the marauders. Mr. E. L. Gove[109] of Madelia, in a communication to the author, asserted that Dr. Charles O. Cooley (1850-1912) of Madelia, a member of the Minnesota State Medical Association, was the physician who ministered to the wounded desperadoes. Mr. Gove denied that the late Dr. George Henry Overholt (1842-1928) of Kenyon attended the famous robbers, as the *Journal-Lancet* announced at Dr. Overholt's death: "He took part in the capture of the famous James-Younger gang who raided Northfield and rendered first aid to their wounded."[110] This particular controversy, although it is not pertinent to the present study, would be a most interesting problem in regional medical history to pursue. Dr. Woods moved to Montgomery in about 1887 or 1888, and in 1903 was practicing in Owatonna. He died of pneumonia on December 24, 1903.[107]

Dr. Jacob W. B. Wellcome (1825-1906) was born in New Portland, Maine, on June 4, 1825, and was educated at Burnham's High School.[111] He came to Garden City in Blue Earth County in 1858, from Wisconsin. At the age of nineteen or twenty he began the study of medicine under a preceptor, but many years were to pass before he would receive the degree of Doctor of Medicine. In 1862, Dr. Wellcome was appointed examining surgon by the War Department, and for seven months he served as surgeon to the Tenth Minnesota Infantry Regiment. In 1871, Dr. Wellcome moved to New Ulm, and in 1875 he went to Sleepy Eye, where he remained for the rest of his life. In 1872, he was appointed to the post of examining surgeon for pensions, a position he occupied until 1876.[111] At Sleepy Eye, Dr. Wellcome became a charter member of Albert Chapter No. 31 of the Royal Arch Masons, and surgeon to the Chicago and Northwestern Railway Company. He was a member of the first board of censors of the old Minnesota State Eclectic Medical Society, which he helped to establish at Owatonna on May 26, 1869, and which he served as vice-president and secretary, although he did not at that time have his doctor's degree. It was Dr. Wellcome's custom periodically to attend lectures at the old Saint Louis College of Physicians and Surgeons, and in 1883 he obtained the degree of Doctor of Medicine from this institution. He was licensed to practice medicine in Minnesota on October 11, 1883.[83] Dr. Wellcome was the preceptor of several Minnesota physicians, including his own son, Dr. Jacob W. B. Wellcome, Jr. (1869-1935), who was graduated from the Saint Louis College of Physicians and Surgeons in 1892. It is interesting to notice that when Dr. Wellcome was proposed for membership in the Minnesota State Medical Society at that organization's fifteenth annual session at Minneapolis in 1883, objection was raised to his election by a member from Dr. Wellcome's territory, possibly on the score of Dr. Wellcome's eclecticism. Nevertheless, he was elected to membership.

The senior Wellcome died of a malignant process of the shoulder on April 8, 1906, at his home in Sleepy Eye. At his death he was a member of the Brown County Medical Society, the Minnesota State Medical Association, and the American Medical Association.[112] An unidentified writer[113] in the *Journal of the American Medical Association* called him "one of the most remarkable men in

the history of Minnesota." Andrews[113] contributed the following sketch of Dr. Wellcome to the aforementioned journal:

> Perhaps the most interesting part of his professional career was at Garden City. When he located there in 1858, he was on the extreme border of civilization; to the west lay a broad expanse of prairie, with here and there a settler; the roads were mere paths, the streams without bridges and many of the frontiersmen living in sod houses. The timbered portions of the country prior to 1862 were inhabited by the red man. He and his tepees were more numerous than the white settlers and their shanties. The night was often made hideous by the whoop of the Indian and the howl of the prairie wolf. In winter there were frequent blizzards, rendering traveling not only difficult but dangerous to life and limb. Such was the condition of the country when Dr. Wellcome began his practice in Garden City. Often at great risk to his life in winter he would respond to calls ten, twenty and thirty miles away over the broad prairie and through blinding snow storms. During the spring freshets the danger was no less because of the swollen streams. These the doctor had to ford, sometimes swimming his horses to do so. So large was his practice and so faithfully did he attend to it that in times when there was much sickness he was practically on the road all the time. In 1862, occurred the memorable and most cruel Sioux massacre. Dr. Wellcome was one of the first to take up arms to protect the frontier settlers; for a while he acted in the double capacity of soldier and surgeon.

In November, 1863, **Dr. Thomas Adams Pierce** (1829-1905) came to the city of Winona from Galena, Illinois. Dr. Pierce was born at Bath, Maine, on December 20, 1829, and was educated at the Litchfield Academy in Litchfield, Maine.[114] At the age of seventeen he began the study of medicine, and soon entered the Homœopathic Medical College of Pennsylvania (now the Hahnemann Medical College and Hospital of Philadelphia), where he studied from 1846 to 1850. He was graduated with the degree of Doctor of Medicine in 1850, and began to practice in Norristown and Wilkes-Barre, Pennsylvania. He spent the winter of 1857 in Washington, D. C., where he became the fast friend of Congressman Elihu Benjamin Washburne (1816-1887) of Galena, Illinois, who was the brother of the Minnesota congressman and railroad builder, William Drew Washburn (1831-1912), despite the orthographic difference in the two surnames. It was said that Congressman Washburne offered Dr. Pierce a position in the Army Medical Corps at the outbreak of the War of the Rebellion, an offer which Dr. Pierce rejected. By virtue of his introduction to Congress through his friendship with Congressman Washburne, Dr. Pierce began to collect the *Congressional Globe* and the *Congressional Record*. Eventually he acquired a library containing more than 300 volumes of these two publications.[114]

In 1858 he went west to Waukegan, Illinois, and later settled at Galena, Illinois, possibly at the solicitation of Congressman Washburne. He remained at Galena until 1863, when he journeyed to Winona and opened an office on Second Street above the old Wickersham pharmacy.[115] On May 14, 1872, at Rochester, Dr. Pierce was elected president of the Southern Minnesota Homœopathic Medical Society.[6] In 1872, also, Dr. Pierce was a candidate for the State Legislature from Winona County on the Democratic-Liberal Republican ticket, but he was defeated by only seven votes.[114] In 1879 he was elected a school director from the second ward in Winona, and was reëlected in 1881. During one term of his tenure he served as president of the Board of Education. It was said that although Dr. Pierce was an independent in politics, his inclination was toward the Republican Party. Two of his intimate friends in Minnesota were General William Windom (1827-1891), United States Senator from Minnesota and Secretary of the Treasury in the cabinets of James A. Garfield

and Benjamin Harrison, and Colonel Mark Hill Dunnell (1823-1904), Congressman from Minnesota and a founder of Pillsbury Academy at Owatonna.[114] It was written that Dr. Pierce's only defect as a practitioner of medicine was his unwillingness to press his patients for fees.[114]

Illness incapacitated Dr. Pierce in April of 1903, forcing him to discontinue a practice of almost forty years in Winona.[114] He died at his home at 365 Johnson Street in Winona at 4 o'clock in the morning, January 4, 1905.[114,116]

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*References 1-18 appear in the June issue, page 479; 19-37 in the July issue, page 572; 38-58 in the August issue, page 674; 59-81 in the September issue, page 769.

(To be continued in the November issue.)

President's Letter

OUR MEDICAL EXAMINING BOARD

AS YOUR president and representative, it has been my pleasure to accept invitations and to visit many parts of our state during this year, as well as various adjacent states; to attend meetings of lay organizations as well as medical societies and, all in all, to observe the standing of the medical profession among the people.

It is with an ever-growing sense of profound satisfaction that I, as a medical man, observe that our profession more and more is finding its place in the innermost lives of the people, as well as at the top of medical thought in the various communities.

Gradually the fact that no other profession is giving of its time and money so unselfishly to our government and state as demonstrated in the building of the new selected army, and that we are receiving no compensation except that satisfaction of a work well done, is beginning to have its influence on public thought. No other profession is looked up to as being the source of sound medical advice. We apparently are giving satisfaction. Integrity will get its just reward.

We are a close-knit profession, accused many times of selfish prerogatives, but can it truthfully be said that a profession which gives of itself to the people as we do, is selfish? We are certainly entitled to every consideration from our communities and gradually are getting it.

Not only are we the guardians of public health from the standpoint of giving rules for proper health conduct, but we are alert, through our State Board of Medical Examiners, to unethical practices within our ranks and, therefore, in protecting the public against miscarriage of medical practice.

At a recent meeting in a neighboring state, it was found that the medical profession there was just beginning to see that a strong board of medical examiners is a very essential thing; that annual registration is necessary in making possible a check-up on unlicensed practitioners; and that in that state they were harboring many men of disreputable reputations who have been forced to discontinue in states such as ours where medical boards with stamina exist. They are now to proceed along the lines laid down in Minnesota.

I wish to express my sincere appreciation of the work which our board in this state is doing to elevate the high standing which our profession has with the general public, and to commend the untiring efforts of their legal adviser in ferreting out and prosecuting cases of unethical practice both without and within our profession.

B. J. Branton, M.D., *President*

Minnesota State Medical Association.

Editorial

MINNESOTA MEDICINE

Official Journal of the Minnesota State Medical Association

Published by the Association under the direction of its Editing and Publishing Committee

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BUSINESS MANAGER
J. R. Bruce

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SULFADIAZINE

IN the search for dyes less toxic, and effective over a wider range of infections, a new sulfanilamide compound known as sulfadiazine has been synthesized. First produced in 1940 by Roblin and his colleagues of the American Cyanamid Company, enough laboratory observations and clinical tests have been made to warrant the drug's recent appearance on the market.

It has been found to have some distinct advantages over sulfanilamide, sulfapyridine and sulfathiazole. Although poorly soluble in water, the drug is quickly absorbed from the intestine and reaches a sufficient concentration in the blood more quickly than in the case of the other dyes. Being more slowly eliminated by the kidney, the blood concentration is also better maintained. Since, too, less of the sulfadiazine is conjugated in the animal organism there is less likely to be evidence of kidney irritation. The conjugated acetyl sulfadiazine also is more soluble than the other acetylated compounds.

From a clinical standpoint the drug is said to be even less toxic than sulfathiazole, although occasionally eruptions have appeared and nausea or vomiting has been reported in some 10 per cent of cases.

Spink in his recently published book* reports his experiences with the drug as well as the reports of others. He concludes that sulfadiazine is as effective in pneumococcic pneumonia as sulfapyridine or sulfathiazole; that it is as effective as sulfanilamide in streptococcic infections, and is nearly the equal of sulfathiazole in staphylococcic infections. Dingle cured twelve of thirteen individuals suffering from meningococcic meningitis with the drug alone. It is probably just as efficacious in gonococcic infections as sulfapyridine or sulfathiazole although insufficient reports have appeared. Creevy found it effective in acute urinary tract infections while permanent recovery in chronic infections was the exception.

The drug, according to Spink, can be administered in the same dosage as sulfapyridine and sulfathiazole, with the expectation that the blood concentration will be higher from the same dosage of sulfadiazine after a few days because of its slower elimination. It has been the practice at the University Hospital in cases of pneumonia to give an initial dose of 4 grams of sulfadiazine followed by 1 gram every four hours until the temperature is normal and then 1 gram every six hours for two days cutting the dose in two the next two or three days. The tablets are put out in 0.5 gram size. When needed the drug may be administered in 5 per cent of the sodium salt intravenously.

The drug is not foolproof and patients taking sulfadiazine must be watched for possible, though less likely, toxic reactions.

*Spink, W. W.: Sulfanilamide and related compounds in general practice. Chicago: Year Book Publishers, 1941.

NATIONAL PHYSICIANS COMMITTEE

THE state branch of the National Physicians Committee for the Extension of Medical Service, under the leadership of Dr. Frank Savage, is concentrating its efforts on a statewide campaign to elicit the moral and financial support of members of the Minnesota State Medical Association.

In spite of numerous articles on the purposes of the committee, which have appeared in Minnesota Medicine, and in spite of a number of circular letters to our membership, there is evidence of lack of information regarding the purposes and activities of the committee.

The medical profession and the American system of private practice have been subject to attacks in spite of the fact that the morbidity and mortality figures show that the health and longevity of our citizens surpass those of any country in the world. Even the Federal Department of Justice has succeeded in having the profession convicted of a criminal combination in restraint of trade. This governmental attack and the attempt to put through the Wagner bill, which would have been a long step towards state medicine, are simply indicative of the existence of a strong element, particularly in the government, which would like to change medical practice in the country, in imitation of state medicine in European countries, to the detriment of medical practice and the health of our citizens.

Although there is no evidence of any intention at this time to resubmit the Wagner bill to Congress, there is evidence of the desire of those in official positions to take advantage of the situation produced by the national emergency to extend governmental medical service to the personnel of defense projects, which can well be handled by local physicians, and to rejected draftees.

There is plenty of evidence of need for educational propaganda (using that much abused word in its best sense) regarding the best interests of our citizens from a medical standpoint. Any measure that works for the betterment of medical practice results in the betterment of the health of our people. Remove the stimulus of competitive private practice, and substitute political control and medical care deteriorates. Plenty of examples of this exist in the world today.

The National Physicians Committee is in the main the publicity and educational agency of the physicians of the United States. As has often been stated, the American Medical Association has as its main function the scientific education of physicians. It has also done a good job in disseminating scientific knowledge to the public. It cannot carry on propaganda in the field of medical economics, so some other organization has to assume this function and the National Physicians Committee has been doing just this for the past year and a half.

Every physician in the United States who has the future of medical practice in our country at heart and wants it to reach even higher levels than it has in the past; every physician who wants the citizens of this country to receive the best possible type of medical care, should join the National Physicians Committee, and not only make a contribution to help it continue the efficient publicity work it has already done, but should constitute himself a committee of one to impress the importance of the American system of medical care on his patients.

Contributions should be made payable, and sent direct, to the National Physicians Committee, Pittsfield Building, Chicago.

WASSERMANN LABORATORY REPORTS

THERE has been such a marked increase in the number of blood specimens submitted for serological testing for syphilis in recent years that it is all the more important that the laboratory reports be correctly interpreted. With the increase in the kind of tests reported some often as positive and some as negative, it is not surprising that physicians not infrequently have difficulty in interpreting the reports. In order to clear up the situation we are publishing in this number an article entitled "The Interpretation of Serological Tests for Syphilis" written especially for Minnesota Medicine by Dr. Francis W. Lynch, Clinical Associate Professor of Dermatology, at the University of Minnesota Medical School. We recommend the thoughtful reading of this article by all who have occasion to interpret these laboratory reports.

UNITED CHINA RELIEF

AMONG the many relief agencies that America has the privilege of supporting in the war-torn world of today, is that known as the United China Relief. This agency has had less publicity than some of those

furnishing assistance to the allies. China has been offering a stubborn resistance to Japanese aggression and with comparatively little outside assistance. That she is now receiving from the United China Relief substantial aid is a matter for some satisfaction.

In charge of the Medical Division of the organization is Dr. Walter B. Cannon. Dr. Co Tui, a native of Amoy, China, trained at the University of the Philippines and at the Michael Reese Hospital in Chicago, and at present head of the Laboratory of Experimental Surgery at New York University, is vice chairman of the organization, and also on the commission sponsored by the United States government in charge of all purchases here for the Chinese government under the lease-lend program.

The United China Relief organization in coöperation with the American Red Cross has been conducting a campaign to raise $5,000,000 for relief for China. The American Bureau for Medical Relief for China, one of eight agencies coördinating their work under the United China Relief, recently authorized the expenditure of over $200,000 for the shipment of medical and relief supplies to Free China. It is interesting to learn that "Bowl of Rice" parties held throughout California under the leadership of Paul S. Smith, publisher of the *San Francisco Chronicle,* resulted in the raising of $108,000 for China Relief.

Relief has consisted in the shipment of drugs and vaccines, the support of first aid and Red Cross units, and hospitals and medical training centers in Free China. Assistance was given in rebuilding the Red Cross Headquarters and clinic in Chungking which was bombed August 22.

American financial help has assisted in maintaining in China one of the most remarkable relief corps in existence. The Chinese Red Cross Medical Relief Corps was organized by Scottish trained, Dr. Robert K. S. Lim. After seeing service in World War I, and upon his return to China, Dr. Lim organized medical corps for the training of medical students and young doctors for Red Cross work. He organized the Medical Corps into mobile operating, nursing and preventive units. Scores of mobile medical units, which on an hour's notice can be moved, are now operating close to the fighting lines in China under the Chinese Red Cross. They render first aid and their stretcher bearers evacuate the wounded by stages back to the base hospitals. Roads having been destroyed in some areas for a depth of 100 miles back of the front, motor ambulances are impractical in these areas. Dr. Lim has also built a medical center at Kiveiyding for the training of workers in sanitation, engineering, construction of filtration plants, model wells, and the like. Seven additional emergency medical training centers have also been established for training personnel in the elements of nursing and preventive medicine. These centers may become permanent medical schools after the war. Beginning July 1, 1941, the American Bureau for Medical Aid for China, through United China Relief, has been sending $5,000 a month to China to support Dr. Lim's training schools and orthopedic centers, and to supplement the contributions of the American Red Cross.

Contributions for medical aid to China may be so designated and sent to United China Relief, 1790 Broadway, New York, N. Y.

INTERNATIONAL MEDICAL ASSEMBLY

Responses from not only the Northwest, but from all over the country, have been received from doctors planning to attend the International Medical Assembly in Minneapolis, beginning Monday, October 13. Twin City physicians are requested to register at either the Nicollet or Radisson Hotels on Sunday, October 12, to avoid congestion Monday morning.

A Pre-Assembly clinic to be conducted by local physicians will be held at the Minneapolis General Hospital on Saturday, October 11. The Post-Assembly clinic will be held at the University Hospital the following Saturday.

Tickets for the banquet Wednesday evening at the Radisson Hotel should be obtained at the registration desk. Among the speakers to be heard at the banquet will be Dr. Roscoe R. Graham of Toronto, president of the Assembly, who will speak on "The Relations of Canada and the United States to the War"; Dr. Frank H. Leahy of Boston, president of the A.M.A., who will speak on "Present-day Problems of Medicine"; Dr. Evarts A. Graham of Saint Louis, president of the American College of Surgeons, whose subject will be "Medical Responsibilities Placed on America by the War"; Dr. George W. Crile of Cleveland, past president of all three organizations, who has chosen the subject "Lessons from Big Game Hunting." At the speakers' table will be Dr. Donald Balfour of The Mayo Foundation; Dr. Harold S. Diehl, dean of medical sciences at the University Medical School; Dr. Russell W. Morse, president of the Hennepin County Medical Society; Dr. Edgar J. Huenekens, president-elect of the same society; Dr. Thomas J. Kinsella, chairman of the Clinic Committee; and Dr. Charles E. Proshek, local chairman of the Hennepin County Committees. Dr. Proshek will introduced Dr. Roscoe R. Graham, who will act as master of ceremonies.

An innovation in connection with the Assembly this year will be a dinner at the Minneapolis Women's Club, Monday evening, October 13, for the members of the Medical Women's Association in attendance at the Assembly.

TUBERCULOSIS AMONG INDUSTRIAL WORKERS

In a large group of industrial workers the proportion of the cases of tuberculosis found in a minimal stage has almost trebled since 1929. Moderately advanced cases have decreased slightly and far advanced cases are about one-third the former proportion. This change is explained largely by the fact that in recent years fluoroscopic examinations of the chest (and roentgenograms when indicated) have been made prior to employment and as part of the annual routine examinations of all employes of the Metropolitan Life Insurance Company.—From *Bulletin of Met. Life Ins. Co.*

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

CRISIS IN MEDICINE

There is much talk these days about the "crisis of capitalism" and far less than formerly about the crisis of private medicine.

To many physicians, however, and to other informed observers, it appears obvious that the threat to capitalism is also a threat to private medical service and that extraordinary effort on the part of medical men is needed to save medicine from being drawn into the stream of government regulation.

The exigencies of the defense program have precipitated the crisis in business. Caught between priorities, defense contracts, civilian needs, taxes, labor demands, strike threats and price controls, business men may well be troubled about the future of the capitalistic system of America.

By surface comparison medicine appears to enjoy a happy freedom from such burdens and anxieties.

Actually the threat to medicine is no less grave though reminders of it are currently crowded out of the headlines.

No Priorities

Defense requirements may seriously interfere with the medical service to civilians, especially in rural districts; and while there is, as yet, no priority, strike or price control problem and no increase in government restrictions upon the individual physician in the conduct of his practice, it is well to remember that there is in the defense hierarchy an office called Office of Health Defense and Welfare Services. Civilian complaints of lack of service, or of unsatisfactory service, will undoubtedly go to that office in an atmosphere where suppression and control of civilian activities are a normal part of the day's work.

Fortunately for medicine, the director of this office at the moment is Federal Security Administrator Paul V. McNutt, who has shown himself on several occasions to be a friend. But directors in defense organizations change over night and complaints about medical service do not fall upon deaf ears in any Washington department. Furthermore, it is a certainty that the considerable number of men and organizations who have long been interested in health insurance promotions will make capital of any defense emergency.

"Business As Usual?"

Just now it is the hard-pressed business man who is charged with shirking the defense effort in favor of "business as usual." How soon will the doctor face the same firing squad?

If he escapes it will only be because he has carried on so effectively in spite of odds, that complaints are manifestly foolish and unfounded.

No amount of organized opposition will stem the trend more than temporarily if it can be shown that accepted preventive services are neglected no matter how good the reason; or, for example, that early treatment of cancer is prevented in any considerable number of cases by failure of general private practitioners to diagnose them in the early stages.

These are times when every individual practitioner stands in the front line and what he does to convince his community that he is doing a better job than any bright new health unit established with government funds could do in his place in the end will tell the tale.

HELP FOR THE DOCTOR

To give the private practitioner in Minnesota the maximum aid for his task as leader in public health education and preventive medicine, as well as practioner of medicine in his community, the Minnesota State Medical Association has a comprehensive coördinated program which is now getting under way for 1941-42.

First in usefulness is perhaps the so-called "Subject-of-the-Month Program" by which special material is prepared on a single subject each month and all public and medical programs during the month are directed toward that subject. An important part of this program is the packet of new scientific and public health material on the subject sent upon request to any member of the association. These packets include new scientific material and also material for preparation of talks to community groups and for education of patients in the doctors' office. Members are urged to use the material as extensively as possible in public education during the month selected.

October Subject

A new plan by which a special consultant has been appointed for preparation and summary of material each month will be followed this year. The October subject is nutrition, selected to give Minnesota doctors the best possible assistance in extending public knowledge of food values in the emergency. Dr. R. D. Williams of Rochester is consultant for this packet.

As always, the weekly radio program and the regular news service to country papers will be directed during the month to the general subject of nutrition. Speakers will be supplied through the State Office to any interested organization, also to medical societies who wish to include some phase of the subject on their scientific programs.

In addition to the packet material there is a regular Speakers' Library in the State Office containing extensive files of recently published material on a wide index of subjects. This material is available on a loan basis to any member who cares to write for it.

For Vaccination Programs

The importance to the public health and in equal measure to the future of private medicine of extensive medically sponsored immunization and vaccination programs cannot be over-estimated. Many things have operated to halt such programs in the past. The local community doctor may be innocent of blame but clamor for government agencies to assume the responsibility will not take the doctor's innocence into account. Minnesota, next to Iowa, had more cases of small pox in 1940 than any other state in the United States. There is only one reason why, as every informed person knows; that is that vaccination has lagged and physicians must redouble their efforts to see that all babies and—failing that—all school children are vaccinated in Minnesota. The record is better for diphtheria prevention but immunization is acknowledged to be the right of every child and no effort should be spared by physicians to see that it is made available.

Packets of material which included aids to organization of community programs as well as authentic scientific methods were sent out widely over the state last fall. This material is in the hands of every county medical society official, every member of the medical advisory committees throughout the state and every public health nurse in the state. Additional advice and assistance can be secured from the state office or the State Board of Health.

Picture Bright

In every other aspect of public health the picture is bright in Minnesota. New records, among the very lowest in the country, were established last year in death rates of mothers and babies, in tuberculosis and in venereal disease control.

The combined efforts of the physicians and the state department of health which made these records possible are expanding into new fields this year.

Under sponsorship of the Committee on Maternal Health a study of maternal deaths is now underway with the aid of the health department to see if the new low of 2.2 maternal deaths for every 1,000 births can be reduced further. The effort to cut premature infant deaths by demonstration and instruction which began more than a year ago with the aid of the Division of Child Health is being carried to new parts of the state. The joint effort to control venereal disease which has gone on in Minnesota since World War I and which has been crowned with phenomenal success goes steadily forward. The most recent milestone in this advance has been the study and standardization of laboratories doing blood tests throughout the state.

Experiment in Meeker County

Tuberculosis mortality and morbidity rates have declined steadily in Minnesota; but it was left to the Committee on Tuberculosis of the Minnesota State Medical Association to conceive

and put into effect a daring new concept of complete eradication. The Meeker county program, initiated by the committee last spring, proposes to show the world, literally, what can be done to wipe out tuberculosis in one county by following the veterinarians' plan of cattle testing on the area basis. This project, initiated, financed and carried forward by the doctors of the state, is already well advanced.

The experiment is being watched with great interest everywhere and no small element in that attention lies in the fact that this is a public health experiment initiated and carried on by the doctors exclusively.

STRAWS

Indications of the way the wind blows in Washington are to be found in testimony on the general subject of the social security program given by Arthur J. Altmeyer, Chairman of the Social Security Board, before the House Committee Investigating National Defense Migration. Said Mr. Altmeyer:

"At the present there is a justifiable preoccupation with the development of the armed forces and with the manufacture of munitions, supplemented by the commencement of a coördinated program for defense, health and welfare activities, especially for areas near cantonments and for industrial areas expanded or developed under the defense program. Along with this emergency phase, the strengthening of underlying measures for social security must go forward. I hope the Congress will give concerted and continued attention to the need for a comprehensive program designed to spread more evenly and more equitably the economic burden of ill health, the most important gap in the present framework of social security. Through these next major steps in the protection of health and welfare, our Federal Government could complete the basic architecture of the defenses it began to build in 1935 for the economic and social security of individuals, families, and the nation.

"Unhappy Confirmation"

"We find unhappy confirmation of inadequacies in our health services, reported two and a half years ago by an inter-departmental committee, in the preliminary findings of the draft boards that approximately 40 per cent of our young men have defects so serious as to prohibit or limit their participation in selective service and military training.

"You as well as we are well aware that a pattern for health security has been laid out. Last year and this, Congress has had specific bills available for careful study, bills intended to enact sound programs to meet well-defined needs for new hospitals, clinics and sanatoria and for funds to encourage their effective use; for strengthened public health, maternal and child health services; for more adequate medical services for all the people; and for protection against disability.

Sharp Clashes

"Some sharp clashes have centered around the proposals for health insurance. There are those who say that such proposals lead inevitably to 'socialized medicine,' a vague phrase. 'Socialized medicine' is something to which I am opposed if that phrase means a system which destroys the personal relationship between the patient and his doctor. What we are interested in is the destruction of an even more personal relationship—the personal and exclusive relationship between the patient and his disease. In that we and the doctor have a common aim. But this is largely beside the point, because there is no reason why a plan cannot be evolved which will preserve the patient's right to choose his doctor. Indeed, I believe it is possible to develop a plan which will make it possible for a great many patients to exercise that right for the first time. The present trouble about free choice of a doctor is that so many people have neither a choice nor a doctor.

Must Assure People

"Health problems which demand attention call for increased efforts on two broad fronts: on the one hand, the provision of adequate facilities for the prevention, diagnosis, and care of illness where these are now insufficient or lacking; and, on the other, means of making it possible for individuals to use such services when they are available. We must be able to assure people that they will have a self-respecting income and independence when illness interrupts their ability to earn—to assure them, in plain words, that they can afford to admit they are sick, that they can better afford to stop work than to risk death.

"Measures for health security are helping to pave the way toward giving Americans a more secure footing in life and toward strengthening our national security. In addition, I need only mention to a group such as this the crucial contribution of other general measures for economic progress, among them fair standards for wages and hours, control of child labor, advancement of workmen's compensation, the safeguarding of industrial home work, the more adequate provision of housing, and the beginning of a national program for more adequate nutrition.

No Nation Stronger

"Our immediate program is national security. But no nation can be stronger than its people. Our continuing concern is the strengthening and deepening of our will to the American way of life, our conviction that democracy is the best way and—much of the world notwithstanding—that it is a feasible and practical way of life. We must recognize, as Britain has recognized, that the morale of the home front is essential. In peace or in war, we cannot afford to do less than our utmost to strengthen the place of health security in the 'seamless web' of our national life."

"Eliminate the Bugaboo"

From the *American Federationist* as quoted recently in the *Chicago Daily News:*

"Social security as it is operating today is like a 1930 air force trying to protect American families from an economic Luftwaffe of death, old age, unemployment, disability, and destitution, in the opinion of Robert J. Watt, international representative of the American Federation of Labor," this article states. Proposals for expanding and integrating social insurance are made by Mr. Watt in the current issue of the *American Federationist.* "Social insurance, as the British have learned, is one of the major assets which makes a democracy capable of self-defense because it makes the democracy worth defending," Mr. Watt states. Specific objectives listed by Mr. Watt are: "1. A complete and integrated social insurance program for the entire working population, established on a national scale; 2. Inclusion of some 20,000,000 persons not now covered by the old-age pension system; 3. Disability insurance, established on the same basis as old-age insurance, with the same administrative machinery; 4. Health services, which could be set up, 'if we faced facts and eliminated the bugaboo raised by a few lobbyists for the medical profession'; 5. A Federal, instead of a State system of unemployment insurance."

Free Care in New Zealand

News from New Zealand as reported in a recent issue of the *New York Times:*

"Launching a campaign against the Government's plan for free medical care, doctors asked, September 10, for a Royal Commission to investigate the implications of the measure which will soon be presented to Parliament. The Canterbury division of the National Medical Association called the measure a piece of coercive legislation to which doctors must submit or starve. They also said that doctors are now working double time, due to the numbers sent abroad for war service, and they could not possibly cope with the increased demands resulting from the proposed system of standard medical care. Doctors directing the campaign for a Royal Commission free from political control said that freedom of the individual was always a fundamental principle of democratic life while it was now proposed to coerce a section of the people under a State medicine."

EMERGENCY MEDICAL SERVICES

Experience in Britain has shown that organization of emergency medical service is an indispensable part of Civilian Defense.

In industrial districts and on the seaboards, the need is especially urgent for obvious reasons; but a complete organization is asked for everywhere by the U. S. Office of Civilian Defense since the time for preparation is before—not after—in any conceivable emergency.

The first of a series of bulletins on the subject has just been issued by Mayor F. H. LaGuardia of New York, director of Civilian Defense, and has been sent at the request of Chief Medical Officer George Baehr, to officers of all county and district medical societies in Minnesota. This bulletin deals with details of organization and personnel. The second, to be issued later, will list supplies and equipment needed.

Emergency medical services are organized nationally by districts to coincide with the Army Corps Areas. Headquarters for this district are therefore located at Omaha. Most medical facilities from which civilian defense organizations in each state will be developed are at the local level, however, and it is therefore regarded as advisable that a local chief of emergency medical services be appointed as the first step in organizing medical facilities for emergencies. State councils will define defense areas and weld these areas into coöperating units. In the preparation and execution of plans, liaison officers of the U. S. Public Health Service attached to headquarters of the Army Corps Area will be available for assistance.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Dubois, M.D., Secretary

Revocation of the License of Harry A. Miller, M.D.

In view of the incorrect and misleading statements that have been published in reference to the above entitled case, the Minnesota State Board of Medical Examiners wishes to make the following statement:

Following an investigation made by this Board during the first week in May, 1941, concerning the professional services rendered by Dr. Miller to a twenty-four-old unmarried patient, this Board advised Dr. Miller, in writing, under date of June 11, 1941, that a hearing would be held at the next regular meeting of the Board on July 11, 1941, in connection with that case. In view of the fact that the matter had been thoroughly discussed with Dr. Miller and his legal counsel prior to June 11, 1941, this Board also requested Dr. Miller to immediately get in touch with his lawyers "in order that they may have sufficient opportunity to prepare, on your behalf, whatever statement they desire to make." It will be seen from the foregoing that Dr. Miller had thirty days written notice that the matter would be taken up at the July 11 meeting of the Board, and over sixty days notice that the matter was under investigation.

At the regular meeting of this Board held on July 11, 1941, Dr. Miller was present in person and represented by his legal counsel. To the everlasting credit

of Dr. Miller, and his attorneys, Dr. Miller admitted the truth about the matter. Dr. Miller expressed his regret for his professional misconduct and a strong plea was made by his lawyers for leniency based upon the many good things that Dr. Miller had done as a physician and surgeon, and as a citizen. The Board concluded that a suspension of Dr. Miller's license for a period of three years, rather than a permanent revocation of his license, was a proper disposition of the case.

The laws of the State of Minnesota provide the grounds for which a physician's license may be suspended or revoked, and make it the duty of the Board to proceed according to law. The Medical Board does not act secretly, nor without an opportunity to the physician to be heard in person, or by legal counsel, or both. The law further provides that a physician, who is aggrieved by the action of the Board in suspending or revoking his license, may appeal the same to the District Court and to the Supreme Court of Minnesota, if he so desires.

One of the most unpleasant duties that confronts the Medical Board is the suspension or revocation of a physician's license. Nevertheless, it must be apparent that there are times when such action must be taken. In the instant case Dr. Miller was represented by very able legal counsel and we are certain that all of his rights were amply protected. Never at any time, during the investigation, nor subsequent thereto, was there the slightest intimation by Dr. Miller or his counsel that the Medical Board was proceeding in an unfair manner.

Minneapolis Woman Given Suspended Sentence for Criminal Abortion

Re: State of Minnesota vs. Ann Stanton.

On September 25, 1941, Mrs. Ann Stanton, forty-three years of age, residing at 3401 32nd Avenue So., Minneapolis, was sentenced by the Hon. Levi M. Hall, Judge of the District Court of Hennepin Cunty, to a term of not to exceed four years in the Woman's Reformatory at Shakopee, for criminal abortion. Following an investigation by the Probation Officer of Hennepin County, Julge Hall stayed execution of the sentence for a period of two years and placed the defendant upon probation.

Mrs. Stanton was arrested on August 18, 1941, following a joint investigation of her activities by Allen S. Chambers, Assistant County Attorney of Anoka County, Minnesota, and Mr. Brist representing the Minnesota State Board of Medical Examiners. Mrs. Stanton is charged specifically with having performed a criminal abortion on a married woman who resides at Anoka, and who became seriously ill following the abortion. Mrs. Stanton, on being questioned in Court, stated that she had performed no abortions prior to August, 1938. She admitted, however, that commencing in March, 1941, she had performed "several" abortions. Mrs. Stanton admitted that she had no medical training of any kind, except that of a practical nurse. When the Court asked her her occupation, she stated that she had done sewing work. Judge Hall made it very clear to the defendant that she was being placed on probation primarily because she had a good previous record and because notwithstanding the fact that she is divorced, she has done very well in raising twin children, who are now thirteen years of age. Judge Hall further cautioned her that any violation of the law in the future would result in her commitment to Shakopee.

The Minnesota State Board of Medical Examiners wishes to acknowledge the very fine coöperation received in this case from Mr. Chambers, the Minneapolis Police Department and the County Attorney's Office.

In Memoriam

Donald R. Claydon

Dr. Donald R. Claydon of Red Wing, died August 28, 1941, following an automobile accident. He was thirty-nine years of age and had practiced in Red Wing fifteen years.

Dr. Claydon was born in Mazeppa, Minnesota, October 7, 1901, and went to Red Wing with his parents when one year old. His primary education was obtained at the public schools in Red Wing and after one year of high school he entered Shattuck Military Academy at Faribault, graduating in 1920. He then spent two years at the University of Minnesota medical school, taking his last two years at the University of Louisville medical school, where he graduated in 1925. Following his graduation he served as intern at the Letterman Military Hospital in San Francisco and then began practice with the Medical Block Clinic in Red Wing. After five years with the clinic Dr. Claydon opened offices with his father, Dr. L. E. Claydon, and Dr. E. M. Baldigo.

Dr. Claydon was a member of the Goodhue County Medical Society, the Minnesota State and American Medical Associations, and the Southern Minnesota Medical Association.

Dr. Claydon was married March 28, 1925, to Judith Boyd of Kentucky. He is survived by his widow and two children, Donald and Ann. His father still practices in Red Wing and a brother, Dr. Howard Claydon, is located at Zumbrota.

WAR AND DISEASE

Whatever the outcome of the present war, we may be sure that disease will be the final victor, accounting for the largest number of victims and carrying on its deadly work long after the voice of the last gun has spoken. It has been said that the last war was exceptional in that for the first time the number of casualties from military action exceeded the number of victims of disease. That may have been true of certain armies during the period of hostilities, but it is emphatically not true when the victims of disease among the civilians are taken into consideration. Every war produces conditions favoring the spread of disease, of which mass movements of population is one of the most important. In preparation for war the strength of armies is increased by recruits from villages and agricultural districts as well as cities. The former fall ready victims to such diseases as measles and mumps, meningococcic meningitis, and the pneumonias.—Frank Boudreau, M.D., *N. Y. State Jour. Med.,* (July 15) 1940.

* * *

Tuberculosis in the United States Army will be reported in accordance with the standards compiled by a group of specialists under the auspices of the National Tuberculosis Association and published by them under the title, "Diagnostic Standards and Classification of Tuberculosis." A copy of the booklet has been furnished each officer in the Army Medical School.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases
J. L. McLeod, Grand Rapids, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
G. L. Berdez, Duluth
T. G. Clement, Duluth
W. S. Lemon, Rochester
T. A. Lowe, South Saint Paul
R. I. Rizer, Minneapolis
S. E. Sweitzer, Minneapolis
O. H. Wangensteen, Minneapolis
A. E. Wilcox, Minneapolis

OCCUPATIONAL DISEASE REPORTING

The State Board of Health is endeavoring to publicize and stimulate the reporting of occupational diseases as is required of physicians by law.

Early in 1940, the Minnesota Department of Health organized an Industrial Hygiene Unit, the function of which was to provide industry with a technical medical and engineering service for the control of occupational diseases, and to promote more adequate medical services within industrial plants. As a preliminary part in its program, the unit conducted a state-wide survey of plant medical services and plant conditions and processes in an effort to gain a first-hand impression of the problem in Minnesota. In July of this year, the State Board of Health changed the status of the Industrial Hygiene Unit to that of a Division of Industrial Health. Effort is being made at this time to stimulate the reporting of occupational diseases since this division is now in a position to investigate, as far as is practical, all reports of occupational diseases and to offer to industry the services of its medical and engineering personnel in the detection and control of hazardous plant conditions. Reports of occupational disease will also indicate in which industries the most serious health problems occur, and thus point out those industrial groups within which special studies should be made. This service by the Department of Health is intended to be of a purely advisory nature.

County
Code

WRITE PLAINLY WITH INK—THIS IS A PERMANENT RECORD
N. B.—Every item of information should be carefully supplied. The exact statement of OCCUPATION is very important. Physicians should state DIAGNOSIS in plain terms. See Instructions on back of certificate.

MINNESOTA DEPARTMENT OF HEALTH
Division of Industrial Health
University Campus Minneapolis

REPORT OF INDUSTRIAL OR OCCUPATIONAL DISEASE

Name of Patient..... (Last name) (First name) (Second name)

Address: Street and No..... City or Village.....

PERSONAL AND STATISTICAL PARTICULARS

Sex	Age	Marital Status	Country of Birth

OCCUPATION

(a) Trade, occupation, or work (in which disease was acquired) .....
Particular kind of work in such trade, etc.....
.....
Date of entering this occupation.....
Employer's name .....
Address .....
Employer's business (goods made or work done).....
.....

(b) Previous occupations:

Name of occupations	Entered (year)	Left (year)

Previous illnesses, if any, due to occupation:

Disease or illness	Year

MEDICAL CERTIFICATE OF DISEASE

Diagnosis .....
Chief symptoms and conditions.....
.....
.....
.....
Date first symptoms appeared.....
Complicating diseases (such as alcoholism, syphilis, tuberculosis, etc.).....
.....
What substance(s) or condition(s) in your opinion caused this affliction? .....
.....
.....
Duration (actual, estimated).....
(Check which)
Additional facts .....
.....
.....

(Signed)....., M. D.
(Address) .....
.....(Date) ....., 19.....

Check here if you desire additional forms ☐

For Instructions See Other Side

For the purpose of this report, an occupational disease may be defined as an illness of the body which has the following characteristics:

1. It rises out of and in the course of the patient's occupation.

2. It is caused by a frequently repeated or a continuous exposure to a substance or to a spe-

cific industrial practice which is hazardous and which has continued over an extended period of time.

3. It presents symptoms characteristic of an occupational disease which is known to have resulted in other cases from the same type of specific exposure.

4. It is not the result of ordinary wear and tear of industrial occupation or the general effect of employment or the kind of illness that results from contacts or activities in life outside of the patient's occupational pursuits.

The following is a quotation from the act providing for the investigation and control of poisoning and disease as a result of the nature of the employment and for the reporting of such cases of poisoning and disease; Chapter 322, Session Laws of Minnesota for 1939.

"Be it enacted by the Legislature of the State of Minnesota:

Section 1. Investigation and Control of Occupational Diseases.—Any physician having under his professional care any person whom he believes to be suffering from poisoning from lead, phosphorus, arsenic, brass, silica dust, carbon monoxide gas, wood alcohol or mercury or their compounds, or from anthrax or from compressed-air illness or any other disease contracted as a result of the nature of the employment of person shall, within five days, mail to the state department of health a report, stating the name, address, and occupation of such patient, the name, address, and business of his employer, the nature of the disease and such other information as may reasonably be required by said department. The department shall prepare and furnish the physicians of this state suitable blanks for the reports herein required. No report made pursuant to the provisions of this section shall be admissible as evidence of the facts therein stated in any action at law or in any action under the workmen's compensation act against any employer of such diseased person. The state department of health is authorized to investigate and make recommendations for the elimination or prevention of occupational diseases which have been reported to it or which shall be reported to it in accordance with the provisions of this section. Said department is also authorized to study and provide advice in regard to conditions that may be suspected of causing occupational diseases, provided information obtained upon investigations made in accordance with the provisions of this section shall not be admissible as evidence in any action at law to recover damages for personal injury or in any action under the workmen's compensation act; provided further, that nothing herein contained shall be construed to interfere with or limit the powers of the department of labor and industry to make inspections of places of employment or issue orders for the protection of the health of the persons therein employed. Whenever upon investigation by the State Board of Health said board reaches a conclusion that a condition exists which is dangerous to the life and health of the workers in any industry or factory or other industrial institution, it shall file a report thereon with the state department of labor and industry." Approved April 20, 1939.

The Form which appears on the preceding page is to be used in the reporting of occupational diseases. Copies of this form will be mailed to physicians in the near future.

AID WELCOMED

It is of interest to note that Minnesota industrialists are already welcoming the aid of the Division of Industrial Health since the law which established the service wisely prohibited the use in court of any information thus secured.

Most physicians, as well as health officers, have watched with some apprehension the tendency of the U. S. Department of Labor to absorb all phases of industrial health into its own program for industry. It is obvious that the program of the labor department cannot be coördinated or integrated with a broad program of adult public health applied to industrial groups such as is possible within a department of health. Enforcement of the health and safety clause introduced under the Walsh-Healy Act into all government contracts for material is placed in the U. S. Department of Labor. The National Committee for the Conservation of Man Power in Defense Industries was oppointed by the Department of Labor to assist industry in meeting provisions of the act. In this state, Mr. A. V. Rowheder of Duluth, Minnesota state representative of the committee, appreciating the fact that the principal responsibility for the protection of the health of workers lies within a department of health and under direction of qualified physicians, appointed Dr. L. W. Foker director of the Division of Industrial Health as a member of his state advisory committee. The division has conducted its program of industrial hygiene in close coöperation with this committee.

Fortunately, there is no lack of medical men qualified by training, experience and interest to aid in carrying on an effective program of health for adult workers in industry in Minnesota.

The Minnesota State Medical Association broadcasts at 11:00 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota.

October 4—Feeding the Nation
October 11—Dieting
October 18—School Lunches
October 25—Nutrition and the Teeth

FORUM ON ALLERGY

The Fourth Annual Forum on Allergy will be held in Detroit, Michigan, January 10 and 11, 1942. Details of the program will be available at a later date.

AMERICAN CONFERENCE ON INDUSTRIAL HEALTH

Under the auspices of the American Association of Industrial Physicians and Surgeons the American Conference on Industrial Health will hold its Second Annual Meeting on November 5 and 6, 1941, at Chicago Towers, Chicago, Illinois. This organization maintains a public forum for all who are interested in the prevention of disease, injury and disability in industry, and the active supervision and promotion of health in industrial groups.

The opening session will be a symposium on the technical problems of industrial health on the basis that health supervision in industry involves two great principles: (1) the adjustment of the working environment to the employe; and (2) the adjustment of the employe to the working environment, including also the human environment. The technical problems are the result of the application of these principles, and run the whole gamut of public health as applied to industry.

The afternoon session will be a symposium on the economics of industrial health, including: (1) organization and cost of a health service, and (2) discussion on the value of industrial health service to the employer, the employe and the public.

The morning of the second day will be given over to a symposium on the social implications of industrial health, discussing how far an industrial health service should go; are hospital and medical care plans related to industrial health service in any practical way; does legislation play a part in this problem; and the evaluation of labor turnover, spoilage, and lack of trained men, together with the experiences of management and the interests of insurance carriers in the medical and social problems presented.

The sessions will close with a schedule of plant medical department inspections, by special arrangements with local industries.

MINNESOTA MEDICAL ALUMNI CLINIC

The Alumni Association of the University of Minnesota Medical School will present its Annual Clinical program at the University Hospitals on Friday, October 31, 1941, which is the day before the Homecoming game between Minnesota and Northwestern Universities.

The 1921 class of the Medical School will celebrate its twentieth anniversary at this time. Several prominent members of this class will participate in the clinical program which is being arranged by Drs. Horace G. Scott, Chairman, J. Richards Aurelius, Harold F. Buchstein, and L. Haynes Fowler.

All physicians are cordially invited to attend this clinical program of the Alumni Association of the University of Minnesota Medical School.

MINNESOTA SOCIETY OF INTERNAL MEDICINE

The fall meeting of the Minnesota Society of Internal Medicine will be held in the Ramsey County Medical Society rooms, Saint Paul, Saturday, October 25, 1941. Dr. Charles N. Hensel, 613 Lowry Medical Arts Building, Saint Paul, is in charge of the program. Dr. Max Hoffman, Saint Paul, is president, and Dr. Reuben A. Johnson, Minneapolis, is secretary of the society this year.

THE MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

Papers presented at the meeting of The Minnesota Society of Neurology and Psychiatry at the Town and Country Club in Saint Paul, September 9, included one on "Symptomatic Treatment of Hysteria" by Dr. Philip H. Heersema of Rochester; and another on "Equine Encephalitis in the Human" by Dr. Alex Blumstein of Minneapolis and Dr. Carl M. Eklund (by invitation) of the Minnesota State Board of Health.

VAN METER PRIZE AWARD

The American Association for the Study of Goiter again offers the Van Meter Prize Award of Three Hundred Dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The award will be made at the annual meeting of the association which will be held at Atlanta, Georgia, June 1, 2, and 3, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or

research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten, double spaced copy sent to the Corresponding Secretary, Dr. T. C. Davison, 478 Peachtree Street, Atlanta, Georgia, not later than April 1.

WABASHA COUNTY MEDICAL SOCIETY

The seventy-third annual meeting of the Wabasha County Medical Society will be held at Wabasha, Thursday, October 9. The business meeting will convene at 4 p.m. in the City Hall and dinner will be served at the Hotel Anderson at 6 p.m. The scientific session following the dinner will include the following: President's Address—"Undulant Fever" (including case reports)—D. G. Mahle, M.D., Plainview; "Enuresis"—Edward N. Cook, M.D., Mayo Clinic, Rochester; "Ligation in Treatment of Varicose Veins"—T. G. Wellman, M.D., Lake City; "Carcinoma of the Cervix"—Victor Bruder, M.D., Winona.

WASHINGTON COUNTY MEDICAL SOCIETY

Washington County Medical Society had its regular monthly meeting September 9. Dr. Russell E. Carlson, an associate of Dr. D. Kalinoff of Stillwater, was elected a member. The guest speaker was John R. Meade, M.D., of Saint Paul. His subject was "diabetes," which he made very interesting. On account of the meeting of the International Medical Assembly in Minneapolis Oct. 13-14, inclusive, our regular monthly meeting for October was voted not to be held.

WOMAN'S AUXILIARY

Mrs. John J. Ryan, *President*
Saint Paul, Minnesota
Mrs. L. R. Boies, *Publicity Chairman*
Knollwood, Hopkins, Minnesota

STATE OFFICERS

At the annual State meeting held in Saint Paul last May, the following State Officers were elected:

President—Mrs. John J. Ryan, Saint Paul
President-Elect—Mrs. W. W. Moir, Minneapolis
Past President—Mrs. M. A. Nicholson, Duluth
First Vice President—Mrs. R. J. Josewski, Stillwater
Second Vice President—Mrs. T. O. Young, Duluth
Third Vice President—Mrs. Neil Dungay, Northfield
Fourth Vice President—Mrs. H. Z. Giffin, Rochester
Recording Secretary—Mrs. L. P. Howell, Rochester
Corresponding Secretary—Mrs. E. V. Goltz, Saint Paul
Treasurer—Mrs. H. F. Wahlquist, Minneapolis
Auditor—Mrs. H. E. Wunder, Shakopee
Parliamentarian—Mrs. J. S. Reynolds, Minneapolis
Historian—Mrs. D. G. Mahle, Plainview.

The first State Board Meeting of the year will be held Friday, October 17, at the Saint Paul University Club at 9:30 a.m., with the new president, Mrs. John J. Ryan, presiding. It will be the pleasure of the group to have as its guest the National Auxiliary President, Mrs. Roscoe E. Mosiman of Seattle, Washington. At the luncheon which follows at 12:30 (also to be held at the University Club) Mrs. Mosiman will be the guest speaker, and it is hoped that many of our State Auxiliary members can be there. Reservations can be made by communicating with Mrs. Lloyd Dack, 106 Cambridge Avenue, Saint Paul, Minnesota, Telephone Emerson 4517.

INTERNATIONAL ASSEMBLY WOMAN'S PROGRAM

The International Assembly of the Inter-state Post Graduate Medical Association of North America will convene in Minneapolis, October 13 to 17.

The Woman's Auxiliary of the Hennepin County Medical Society extends a most cordial welcome to all women guests and women physicians attending.

For their pleasure and entertainment the following program has been arranged:

Monday, October 13

Registration
Reservations for Entertainments
Visits to Exhibits
(Prompt reservations for the various trips and functions will be appreciated by the committee on arrangements.)

Tuesday, October 14

12:15 p.m.
Luncheon and Style Show by the Dayton Company
Dayton's Tea Rooms.....Tickets $0.85

Wednesday, October 15

11:00 a.m.
Tour of Radiation Therapy Department, University Hospital

1:00 p.m.
Luncheon—Coffman Memorial Union
Entertainment by the Coca-Cola Company

7:00 p.m.
Banquet

Thursday, October 16

11:30 a.m.
Sight-seeing Tour of Minneapolis—Courtesy of Hennepin County Medical Auxiliary. Busses leave Radisson Hotel promptly at 11:30 a.m.

1:00 p.m.
Luncheon—Interlachen Country Club
Entertainment—Medical Auxiliary Octet, under the direction of Mrs. Gilbert Seashore. Tickets, $1.00.

The program by the Hennepin County Medical Auxiliary Octet promises to be something new and exciting in the way of entertainment. Special home talent is being secured for your enjoyment. *Come and Laugh!*

The Woman's Program for the Assembly has been arranged by Mrs. F. S. McKinney, Chairman, and Mrs. William Rucker and Mrs. John Curtin Co-chairmen.

How to Use S-M-A Powder

EACH PACKAGE OF S-M-A* CONTAINS ONE MEASURING CUP



1 Empty one tightly packed measuring cup of S-M-A powder into bottle.



2 Add enough warm previously boiled water to make one ounce.

3 Cap bottle and shake powder into solution. Feed at body temperature.



4 Easy, isn't it?



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200 I. U. of vitamin B_1
400 I. U. of vitamin D
7500 I. U. of vitamin A

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ACCEPTED AMERICAN MEDICAL ASSN.

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OF GENERAL INTEREST

Dr. Dietrich D. Rempel of Grand Marais has moved to Lester Prairie, where he has opened offices.

* * *

Dr. R. A. Beise of Brainerd is back at his office in the Beise Clinic after two months' illness.

* * *

A suburban office in Saint Paul has been opened by Dr. Norbert J. Lilleberg at 2062 Ford Parkway in the Highland Village district.

* * *

After three years of practice in Chisholm and Hibbing, Dr. R. H. LaBree has become affiliated with the Duluth Clinic, department of surgery, in Duluth.

* * *

Construction of a 32 x 50-foot building to house the offices and clinic of Drs. Charles Bishop Will and William Wallace Will at Bertha, Minnesota, got under way last month.

* * *

Dr. J. L. McKelvey, head of the department of obstetrics and gynecology at the University of Minnesota Medical School, addressed a meeting of the Kansas Obstetrical Society in Salena, Kansas, October 2.

* * *

Dr. John J. Boehrer of the University of Minnesota Health Service did special work in epidemiology throughout the state for the Minnesota State Department of Health during the summer.

* * *

Dr. Wallace S. Sako who was a fellow at the University of Minnesota Hospitals up to June 30, has joined the staff of the Louisiana State University Medical School, Department of Pediatrics.

* * *

Among medical officers in the United States Army who have been ordered to foreign duty is Captain Harold E. Opsahl of Brainerd, assigned to the Station Hospital at Fort Amador, Balboa, Canal Zone.

* * *

Dr. Alfred M. Ridgway of Annandale was confined to his home for several days last month because of a leg injury suffered in a mix-up with a cement block and a piece of wire.

* * *

Dr. James F. Shandorf of Minneapolis is doing special work in obstetrics and gynecology at Cornell University Medical School in Ithaca, New York. He will be there until July.

* * *

Dr. Albert F. Hayes has opened offices at 519 Lowry Medical Arts Building in Saint Paul, and will specialize in obstetrics and gynecology. He will be associated in practice with Dr. Everett C. Hartley.



Dr. O. J. Esser, who has been practicing at Gibbon since 1928, has moved his family to New Ulm where he has opened offices. New Ulm is his former home. Dr. Esser is a graduate of Marquette Medical School in Milwaukee.

* * *

Dr. and Mrs. R. V. Williams of Rushford were honored by the Fillmore-Houston County Medical Society at a dinner, September 22. Dr. Williams, who is retiring, has sold his practice to Dr. Damon W. Cummings of Byron.

* * *

Dr. Julius H. Winer, a graduate of the University of Minnesota Medical School and brother of Dr. Louie Winer, of Minneapolis, announces the opening of offices at 40 East 51st Street, New York City. His practice is limited to urology.

* * *

Dr. John S. LaDue, who has been clinical instructor in the Department of Medicine at the University of Minnesota Medical School, resigned recently to join the staff of the Louisiana State University Medical School, Department of Medicine, in New Orleans.

* * *

Dr. Paul W. Kabler, assistant chief of laboratories, Minnesota State Board of Health, Division of Preventable Diseases, has been granted a year's leave of absence to do postgraduate work at the Harvard University Medical School.

Dr. H. S. Diehl, dean of the University of Minnesota Medical School, will be in Richmond, Virginia, October 26-29, to attend the meeting of the Association of American Medical Colleges. He is a member of the executive council.

* * *

Dr. A. L. Arends of Sandstone has been named a physician on the staff of the Minnesota Colony for Epileptics at Cambridge. Dr. Arends practiced in Sandstone for four years, coming to that city from Askov.

* * *

At a postgraduate program of the Polk County Medical Society of Des Moines, Iowa, September 17, Drs. Fred Z. Havens and Bayard T. Horton, both of Rochester, discussed "Plastic Surgery" and "Treatment of Headache," respectively.

* * *

Dr. James E. Trow has opened offices at 6 East Diamond Lake Road in Minneapolis. A graduate of the University of Minnesota Medical School, Dr. Trow interned at Charity Hospital of Louisiana in New Orleans. He has been a resident physician at Eitel Hospital in Minneapolis.

* * *

Dr. J. C. Litzenberg of Minneapolis discussed a paper at the meeting of the Central Association of Obstetrics and Gynecology in New Orleans, October



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3-4-5, and also presented a radio lecture. Among other Minneapolis physicians who attended this meeting were Dr. Leonard Lang and Dr. Paul Larson.

* * *

When the New York Academy of Medicine presents its annual Graduate Fortnight, October 13-24, Dr. Edgar V. Allen of Rochester will be chairman of a panel discussion, October 21, on "Peripheral Vascular Disease, Diagnosis and Treatment, including the Role of Tobacco and Alcohol."

* * *

Construction of a new $10,000 addition to the Northwestern Clinic in Crookston was begun last month. The addition, which will practically double the floor space of the clinic, will be 36 by 56 feet and three stories high. It is expected to be completed by February.

* * *

Dr. Henry E. Rokala, who has been associated with the Bray Hospital in Biwabik for the past five years, has purchased the practice of Dr. Samuel P. McDaniel in Virginia. Dr. McDaniel left Virginia, September 1, for Brunswick, Georgia, to practice.

* * *

Alumni speakers at the second triennial reunion for alumni of the University of Michigan Medical School and former staff members and house officers of the University Hospital, held in Ann Arbor, October 2-4, included Dr. William L. Benedict of Rochester. His topic was "Diagnosis and Treatment of Glaucoma."

* * *

Among those whose names appeared on the program for the nineteenth annual fall clinical conference of the Kansas City Southwest Clinical Society held in Kansas City, October 6-9, was that of Dr. Henry P. Wagener of Rochester, whose subject was "The Grading and Grouping of Hypertensive Lesions in the Retina."

* * *

Dr. Norman E. Rud of Minneapolis has joined the staff of the Two Harbors Hospital and Clinic in Two Harbors as head of the newly established department of internal medicine. Dr. Rud, a graduate of the University of Minnesota Medical School, has been associated in practice with Dr. Robert Rizer for the past twelve years.

* * *

After a half year of hard work in a hospital in England, Dr. Wallace Cole is back at his Saint Paul office. He went to England last December to replace Dr. Philip Wilson as director of the American Hospital in Britain, located at Basingstoke, about half way between Southampton and London. The hospital is supported by the British War Relief Society of this country.

* * *

Four members of the Minnesota Society of Neurology and Psychiatry have been named by Dr. D. E. McBroom, newly appointed Director of the Mental Health Unit of the Division of Public Institutions, to serve in an advisory capacity. They are Dr. J. C. Mc-

Kinley, Minneapolis; Dr. E. M. Hammes, Saint Paul; Dr. Fred B. Moersch, Rochester; and Dr. L. R. Gowan, Duluth.

* * *

Miss Ruth Freeman of New York University has been named head of the public health nursing department at the University of Minnesota. She fills the position left vacant by the resignation of Miss Margaret Arnstein who left a year ago to become associated with the New York State Health Department. Miss Arnstein was recently loaned to the United States Public Health Service for special work.

* * *

Dr. Charles B. Craft of Minneapolis became associated October 1 with the Keeton Clinic in Bozeman, Montana, as a partner of Dr. R. G. Keeton. A graduate of Tulane University Medical School in 1935, Dr. Craft interned at the University of Minnesota Hospitals, where he has been since with the exception of one year when he studied at Northwestern University Medical School. For three years Dr. Craft was a fellow of the National Cancer Institute.

* * *

A series of special radio health programs for junior high school pupils will be presented by Dr. William A. O'Brien, professor of preventive medicine and public health at the University of Minnesota, over station WLB on Wednesdays from 11 to 11:15 a.m. This program, endorsed by the Minnesota State Medical Association and the Minnesota Public Health Association, is in addition to Dr. O'Brien's weekly Saturday morning broadcast.

* * *

Participating in the program of the Tri-County Medical Society at Racine, Wisconsin, August 20, were Drs. H. O. McPheeters and James Kerr Anderson of Minneapolis. Their paper, which was illustrated with lantern slides and movies, was "Injection Treatment of Varicose Veins and Hemorrhoids."

Dr. McPheeters also gave an illustrated talk on varicose veins before the Upper Peninsula Medical Association in Ironwood, Michigan, July 16.

* * *

Guest speakers at the ninety-first annual meeting of the Medical Society of the State of Pennsylvania in Pittsburgh, October 6-9, included the following from Rochester: Dr. Louis A. Brunsting, "Sulfonamide Drugs in Dermatology"; Dr. Albert M. Snell, "Changing Conceptions of Portal Cirrhosis"; Dr. Virgil S. Counseller, "Influence of Infection on Abdominal Hysterectomy"; and Dr. William L. Benedict, "Surgical Treatment of Glaucoma."

* * *

Minnesota men on the program for the one hundredth annual meeting of the State Medical Society of Wisconsin in Madison, September 10-12 included: Dr. Henry W. Woltman, of Rochester, "Late Neurologic Manifestations in Cases of Injury"; Dr. Frank E.

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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

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Burch of Saint Paul, "Ocular Manifestations of Head Injuries"; Dr. Henry F. Helmholz of Rochester, "Chemotherapy with the Sulfonamide Group"; and Dr. Philip S. Hench of Rochester, "Classification and Management of Rheumatoid Disease."

* * *

September 22, 1941 was the occasion of a celebration of the thirtieth anniversary of the founding of Saint John's Hospital, Saint Paul, and the birthday of the founder and medical director of the hospital, Dr. Frederick J. Plondke. Among those participating in the program at the dinner in the Minnesota Club were Dr. B. J. Branton, president of the Minnesota State Medical Association; Dr. Joseph Borg, president of the Ramsey County Medical Society; Dr. Arnold Schwyzer; Dr. William A. O'Brien; and Dr. S. A. Arnquist. Among the guests was Miss Magdalena M. Rau, who has been superintendent of the hospital since 1911.

* * *

Three Minnesota physicians participated in the program for the seventy-sixth annual meeting of the Michigan State Medical Society, held in Grand Rapids, September 16-19. They were: Dr. Charles E. Lyght of Northfield, whose paper was entitled, "Some Educational Aspects of Diagnosing Tuberculosis Early"; Dr. Arlie R. Barnes of Rochester, "Problems in the Differential Diagnosis of Coronary Artery Disease"; and Dr. Owen H. Wangensteen of Minneapolis, "Management of Abdominal Injuries."

* * *

The marriage of Dr. William W. Moir, Jr., son of Dr. and Mrs. W. W. Moir, Sr., of Minneapolis, to Dr. Jane Musselman, daughter of Mrs. Roy H. Musselman of Medford, Wisconsin, took place at the Centenary Methodist Church in St. Louis, Missouri, July 12.

Dr. Moir, who is a graduate of the University of Minnesota Medical School, is first lieutenant in the medical corps of the U. S. Army and is stationed at Fort Leonard Wood in Missouri. Mrs. Moir is a graduate of the University of Wisconsin Medical School.

* * *

Medical reserve officers whose orders to report for active duty with the United States Army have been revoked, include:

Leonard K. Buzzelle of Minneapolis, first lieutenant.
Robert J. Cairns of Sanborn, first lieutenant.
George Warren of Minneapolis, first lieutenant.
Thomas Jefferson Edwards of Saint Paul, first lieutenant, who had been ordered to Fort Leonard Wood, Missouri.
Raymond Kenneth Minge of Clarkfield, first lieutenant.
Ralph V. Platou of Minneapolis, first lieutenant.
James F. Shandorf of Northfield, first lieutenant.
James Edward Trow of Minneapolis, first lieutenant.
John Roger Hill, Rochester, first lieutenant, who had been assigned to the Air Corps Gunnery School (nonflying status) at Las Vegas, Nevada.
Wallace William Lindahl, Rochester, first lieutenant, who had been ordered to the Advanced Flying School (nonflying status) at Mather Field, California.

* * *

Dr. Norman Lende, who has been practicing in Faribault since January, 1930, left August 26 for the Panama Canal Zone where he has accepted a position

with the United States Public Health Service. Mrs. Lende and their daughter, Mary Louise, expect to join him some time within the next several months.

Dr. Lende has served as city physician of Faribault since 1933 and as city health officer since 1937, the two offices being combined then. He has also been president of the St. Lucas hospital staff and secretary of the Rice County Medical Society.

* * *

Old friends of Dr. J. L. Adams, pioneer physician of Morgan, paid him an impressive tribute last month, when a bronze plaque bearing a likeness of the doctor was unveiled as part of the Gilfillan Day Festival. Mounted on a massive granite shaft, the plaque is the work of Amerigo Brioschi, noted Saint Paul sculptor. In addition to the likeness of the doctor, the plaque bears his name, James L. Adams, and the legend, "A pioneer doctor. Service to his people filled the life of this man without thought of personal gain."

At the invitation of the committee, Dr. and Mrs. Adams and their daughters came from Van Nuys, California, to be present on the occasion. They were not told, however, the real purpose of the exercises. On the platform with the Adams family were a number of physicians from surrounding towns.

* * *

Medical reserve officers who have been relieved from active duty with the United States Army include:

Gerald Steber Ahern of Minneapolis, first lieutenant, who was assigned to Fort Snelling.

Harold William Havel of Jordan, first lieutenant, who was assigned to Field Artillery, 2d Cavalry Division, Fort Riley, Kansas.

William Robert Love of Rochester, first lieutenant, who was assigned to Corps Area Service Command Station Hospital, Fort Snelling.

George Henry Marking of Osseo, first lieutenant, who was assigned to Fort Snelling.

Donovan Legare McCain of Saint Paul, first lieutenant, Fort Snelling.

Alton Curtis Olson of Minneapolis, first lieutenant.

Duane Charles Olson of Gaylord, first lieutenant, Fort Snelling.

Gustavus Alfred Peters of Rochester, first lieutenant, Air Base (nonflying status) Portland, Oregon.

Frank Walter Quattlebaum of Crookston, first lieutenant, Fort Snelling.

Charles Wesley Rogers of Heron Lake, first lieutenant, Fort Leonard Wood, Missouri.

James Russell Scales of Rochester, first lieutenant, Fort Snelling.

Robert William Vines of Rochester, first lieutenant.

Wilson Weisel of Rochester, first lieutenant.

Laurence Maxon Wiig of Rochester, first lieutenant.

* * *

Residents of Sherburn honored Dr. R. C. Farrish at an open house in the community hall, September 14, to mark Dr. Farrish's fortieth anniversary as a practicing physician in Sherburn. The event was arranged as a surprise on Dr. Farrish.

The reception was attended by some two hundred and fifty of Dr. Farrish's friends. Henry Seifert was master of ceremonies and music added to the occasion. The main address was delivered by Judge J. E. Haycraft, who made his audience appreciate more clearly what the availability of a good doctor means.

A native of Rockwood, Ontario, Dr. Farrish as a boy moved to Saint Paul and graduated from the



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FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course will be offered four times during the year 1942, dates to be announced. Informal Course available every week.

GYNECOLOGY—Two Weeks' Intensive Course will be offered four times during the year 1942, dates to be announced. Twenty Hour Personal Course in Vaginal Approach to Pelvic Surgery November 3rd. Clinical and Diagnostic Courses every week.

OBSTETRICS—Two Weeks' Intensive Course will be offered twice during the year 1942, dates to be announced. Informal Course every week.

OTOLARYNGOLOGY—Two Weeks' Intensive Course will be offered twice during the year 1942, dates to be announced. Clinical and Special Courses starting every week.

OPHTHALMOLOGY—Two Weeks Intensive Course will be offered twice during the year 1942, dates to be announced. Informal Course every week.

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FIRST AID INSTRUCTION FOR BUS DRIVERS

The First Aid Committee of the Minnesota State Medical Association would like to remind the members that they will be called on to give first aid instruction to bus drivers and others at this time and for some time to come because of a law passed by the last legislature. The committee believes that it is logical to make the training as uniform as possible and to stress certain well-known rules for conducting a first aid class that may be useful to any instructor but more so to one who is acting as an instructor for the first time.

1. The class should be limited to twenty or twenty-five persons, unless the instructor has trained assistants available for some of the lessons. The class may be separated into squads and be drilled or examined as necessary.
2. The Red Cross standard first aid text should be followed exactly and not contradicted.
3. Stress should be laid repeatedly on the theme that bad first aid is worse than no first aid. The class should understand that they are learning to be first aiders only and not physicians.
4. Controversy in the class must be avoided. Questions and answers should be limited to the material in the Red Cross first aid textbook.

The committee suggests that the members check with the local Red Cross chapters in their counties to assist them in offering classes in first aid.

The chairman of the committee or its members would be glad to consult with or to correspond with members who are interested.

University of Minnesota medical school in 1901. After an internship at St. Mary's Hospital he began practice in Sherburn, where he has endeared himself to inhabitants of the town and surrounding territory.

Besides being a busy practitioner, Dr. Farrish has found time for golf and has interested himself in landscape gardening. He also has a fine private library. The doctor is a fine type of citizen and his admirers chose to show their love and admiration in this fitting way.

* * *

A number of medical men took part in the convention program of the Minnesota Federation of Women's Club in Willmar, September 23, theme for which was "Health and Defense."

Dr. E. A. Meyerding, executive secretary of the Minnesota Public Health Association, was master of ceremonies; and Dr. B. J. Branton of Willmar, president of the Minnesota Medical Association, addressed the group before the opening of the panel discussion.

Questions selected from hundreds sent in by Minnesota clubwomen were answered by Dr. William A. O'Brien, professor of preventive medicine and public health at the University of Minnesota; Lieutenant-Colonel Richard B. Hullsiek of Saint Paul, medical director of the Minnesota selective service; Dr. O. J. Hagen of Moorhead; Dr. M. C. Petersen, superintendent of the Willmar State Hospital and consultant at Fort Snelling; and Dr. A. V. Stoesser, associate professor of pediatrics at the University of Minnesota. Also Dr. Vern D. Irwin, superintendent of dental health education of the Minnesota Department of Health.

Sister Elizabeth Kenny, Australian nurse whose treatment for infantile paralysis has brought her world renown and who is now instructing nurses at the University of Minnesota and Minneapolis General hospital, was also a guest speaker.

* * *

Army medical reserve officers ordered to active duty within the past few weeks include:

Wallace Everett Anderson, Thief River Falls, first lieutenant, to Camp Grant, Illinois.

John Dennis Barker, Warren, first lieutenant, to Air Base, Portland, Oregon.

George Warren Drexler, Minneapolis, first lieutenant, with 1st Infantry, Fort Leonard Wood, Missouri.

Joseph Arthur Dupont, Excelsior, first lieutenant, with 6th Medical Battalion, Fort Leonard Wood, Missouri.

Michael Allen Garetz, Minneapolis, first lieutenant, with 6th Medical Battalion, Fort Leonard Wood, Missouri.

James Huntington Graves, Saint Paul, first lieutenant, with 92d Engineer Battalion, Fort Leonard Wood, Missouri.

Harry Penn Harper, Rochester, first lieutenant, Corps Area Service Command Station Hospital, Fort Riley, Kansas.

David William Hilger, Saint Paul, first lieutenant, Corps Area Service Command Induction Station, Fort Leavenworth, Kansas.

George Robert Hoffman, Minneapolis, first lieutenant, 1st Infantry, Fort Leonard Wood, Missouri.

Robert William Hollenhorst, St. Cloud, first lieutenant, 6th Medical Battalion, Fort Leonard Wood, Missouri.

Raymond Creighton Hottinger, Janesville, first lieutenant, Fort George Wright, Spokane, Washington.

David B. Kuris, Duluth, first lieutenant, 6th Medical Battalion, Fort Leonard Wood, Missouri.

Brian John McGroarty, Easton, first lieutenant, Camp Grant, Illinois.

Hilbert Mark, Minneapolis, major, to Camp Grant, Illinois.

Albrecht Eugene Muller, Saint Paul, first lieutenant, 6th Medical Battalion, Fort Leonard Wood, Missouri.

Samuel G. Balkin, Minneapolis, captain.

Frederick Joseph Bradshaw, St. Cloud, captain.

Hiram Philip Hampton, Rochester, first lieutenant.

Gordon Francis Madding, Rochester, first lieutenant.
George Oviatt Wood, Rochester, first lieutenant, Fitzsimons General Hospital, Colorado.
Osmund Harald Akre, Clarkfield, first lieutenant, to Air Corps Station (nonflying status), McChord Field, Tacoma, Washington.
John Stephen Ambrusko, Rochester, first lieutenant, to Basic Flying School (nonflying status), Taft, California.
John Byron Beare, Rochester, first lieutenant, Advanced Flying School (nonflying status), Mather Field, California.
Meyer Simon Belzer, Minneapolis, major, 6th Infantry Division, Fort Leonard Wood, Missouri.
John Edward Boysen, Pelican Rapids, first lieutenant, Air Base (nonflying status), Fresno, California.
Bradley Claude Brownson, Rochester, first lieutenant, Air Corps Station (nonflying status), McChord Field, Tacoma, Washington.
James Willis Burks, Jr., Rochester, first lieutenant, Air Corps Station (nonflying status), Fort George Wright, Spokane, Washington.
Wesley Howard Burnham, Minneapolis, first lieutenant, Corps Area Service Command Station Hospital, Fort Leonard Wood, Missouri.
James Clarence Cain, Rochester, first lieutenant, Air Corps Gunnery School (nonflying status), Las Vegas, Nevada.
Paul Joseph Catinella, Rochester, first lieutenant, Basic Flying School (nonflying status), Taft, California.
Arnold Joseph Chlad, St. Paul, first lieutenant, Air Corps Station (nonflying status), McChord Field, Tacoma, Washington.
Daniel Francis Crowley, Jr., Rochester, first lieutenant, Air Corps Station (nonflying status), McChord Field, Tacoma, Washington.
John Prather East, Northome, first lieutenant, Advanced Flying School, Ellington Field, Houston, Texas.
Harold Charles Freedman, Minneapolis, first lieutenant, Basic Flying School (nonflying status), Taft, California.
Gerald Geissler, Hinckley, first lieutenant, Air Base (nonflying status), Pendleton, Oregon.
William Peder Gjerde, Saint Paul, first lieutenant, Air Corps Station (nonflying status), Fort George Wright, Spokane, Washington.
Russell B. Grant, Rochester, first lieutenant, Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyoming.
Samuel Hartley Haigler, Jr., Rochester, first lieutenant, Air Corps Station (nonflying status), Fort George Wright, Spokane, Washington.
Rulon Fullmer Howe, Rochester, first lieutenant, Air Corps Station (nonflying status), Fort George Wright, Spokane, Washington.
Clive Roland Johnson, Rochester, first lieutenant, Air Corps Station (nonflying status), McChord Field, Tacoma, Washington.
James Kenneth Keeley, Rochester, first lieutenant, Air Corps Station (nonflying status), Fort Douglas, Utah.
Mavis Parrott Kelsey, Rochester, first lieutenant, Air Base (nonflying status), Portland, Oregon.
Jack Adrian Killins, Rochester, first lieutenant, Air Base (nonflying status), Portland, Oregon.
Richard Watson Lyman, Rochester, first lieutenant, Air Corps Station (nonflying status), Fort Douglas, Utah.
Daniel James Moos, Minneapolis, first lieutenant, Air Corps Station (nonflying status), Fort Douglas, Utah.
Earl I. Mulmed, Rochester, first lieutenant, Air Corps Station (nonflying status), Fort Douglas, Utah.
Clarence Pearson, Rochester, captain, Air Corps Station (nonflying status), Fort Douglas, Utah.
Robert Joseph Richardson, Rushford, first lieutenant, 6th Medical Battalion, Fort Leonard Wood, Missouri.
Edward E. Rosenbaum, Rochester, first lieutenant, Corps Area Service Command Station Hospital, Fort Snelling.
Frederick William Schilla, Jr., Saint Paul, first lieutenant, Camp Grant, Illinois.
Thomas Scott Sexton, Rochester, first lieutenant, Ogden Air Depot (nonflying status), Ogden, Utah.
Jesse Shapiro, Saint Paul, first lieutenant, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Arkansas.
Stanley John Simons, Akeley, first lieutenant, Air Base (nonflying status), Pendleton, Oregon.
Philip Woodrow Sorenson, Minneapolis, first lieutenant, Air Corps Station (nonflying status), McChord Field, Tacoma, Washington.
John Edwin Teisberg, Middle River, first lieutenant, Air Base (nonflying status), Pendleton, Oregon.
John Donald Van Valkenburg, Floodwood, first lieutenant, Air Base (nonflying status), Pendleton, Oregon.
Rodger Elmer Weisman, Rochester, first lieutenant, Air Corps Station (nonflying status), Moffett Field, California.
Ralph Waldo Emerson Wise, Rochester, first lieutenant, Air Corps Station (nonflying status), Fort Douglas, Utah.
Harlan Lamar Word, Saint Paul, first lieutenant, Corps Area Service Command Station Hospital, Fort Leonard Wood, Missouri.
Jean Paul Wozencraft, Rochester, first lieutenant, Air Corps Station (nonflying status), Moffett Field, California.
John Patrick O'Brien, Rochester, captain.
Robert Oliver Pearman, Rochester, captain.

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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

MICROBES WHICH HELP OR DESTROY US. Paul W. Allen, Ph.D. Professor of Bacteriology and Head of Department, University of Tennessee; D. Frank Holtman, Ph.D., Associate Professor of Bacteriology, University of Tennessee; and Louise Allen McBee, M.S., Formerly Assistant in Bacteriology, University of Tennessee. 540 pages. Illus. Price, $3.50, cloth. St. Louis: C. V. Mosby Co., 1941.

ESSENTIALS OF GENERAL SURGERY. Wallace P. Ritchie, M.D. Clinical Assistant Professor, Department of Surgery, University of Minnesota Medical School. 813 pages. Illus. Price, $8.50, cloth. St. Louis: C. V. Mosby Co., 1941.

CARDIAC CLINICS—A Mayo Clinic Monograph. Frederick A. Willius, B.S., M.D., M.S. in Medicine. Head of Section of Cardiology, Mayo Clinic, and Professor of Medicine, Mayo Foundation for Medical Education and Research, Graduate School, University of Minnesota, Rochester, Minnesota. 276 pages. Illus. Price, $4.00, cloth. St. Louis: C. V. Mosby Co., 1941.

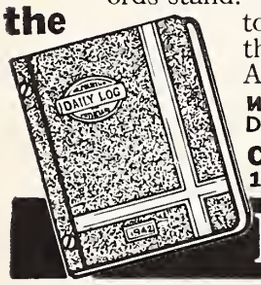
HANDBOOK OF COMMUNICABLE DISEASES. Franklin H. Top, A.B., M.D., M.P.H. Director Division of Communicable Diseases and Epidemiology, Herman Kiefer Hospital and Detroit Department of Health; Associate Professor of Preventive Medicine and Public Health, Wayne University College of Medicine; Special Lecturer in Communicable Diseases and Epidemiology, University of Michigan; Major, Medical Reserve Corps, United States Army. 682 pages. Illus. Price, $7.50, cloth. St. Louis: C. V. Mosby Co., 1941.

SYNOPSIS OF APPLIED PATHOLOGICAL CHEMISTRY. Jerome E. Andes, M.S., Ph.D., F.A.C.P. Director of Department of Health and Medical Advisor, University of Arizona, Tucson; formerly Assistant Professor of Pathology and Clinical Pathology, West Virginia University Medical School; and A. G. Eaton, B.S., M.A., Ph.D., Assistant Professor of Physiology, Louisiana State University School of Medicine, New Orleans. 428 pages. Illus. Price, $4.00, flexible binding. St. Louis: C. V. Mosby Co., 1941.

SULFANILAMIDE AND RELATED COMPOUNDS IN GENERAL PRACTICE. Wesley W. Spink, M.D. Associate Professor of Medicine, University of Minnesota Medical School. 256 pages. Illus. Price, $3.00, cloth. Chicago: Year Book Publishers, Inc., 1941.

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METHODS FOR DIAGNOSTIC BACTERIOLOGY. Isabelle G. Schaub and M. Kathleen Foley, 313 pages. Price $3.00. St. Louis; C. V. Mosby Co., 1940.

This is a remarkably well-written compilation of all of the bacteriological procedures now in use at the Johns Hopkins Hospital. Being the culmination of many years of practical application and intelligent critical supervision, the bacteriologic procedures described might well be adapted by any laboratory seeking practical procedures. The book has been used for instruction of interns, medical students, and student technicians at Johns Hopkins for some time before publication. It contains numerous "tricks of the trade" which are not found in the usual textbooks on bacteriologic technique.

At $3.00 a copy this book should be in the library of every first class bacteriologic department.

ARTHUR H. WELLS, M.D.

MODERN DERMATOLOGY AND SYPHILOLOGY. S. W. Becker and M. E. Obermayer. 871 pages. Illus. $12.00. Philadelphia: Lippincott, 1940.

In this rather large book the authors' prize considerations were to write a volume of modern dermatology and syphilology for the student and practitioner, although they hope that it may be useful to postgraduate students and specialists as well. The authors were very successful in their endeavor to make the book a living thing and yet more informal than most textbooks, by presenting primarily their ideas and methods and secondarily those of other workers.

Especially interesting is the chapter on functional dermatoses and the authors' approach of treating them. Much stress is laid on the social factors which Becker and Obermayer feel are responsible for a large number of skin conditions. Much valuable information is found in the chapter on occupational and industrial dermatoses which contains also a long list giving the concentration of various substances for epidermal patch tests.

The chapters on syphilis, which are introduced by an interesting review of the history and epidemiology of syphilis, are well written and excellently illustrated. The treatment of syphilis is discussed in considerable detail and brought up to date.

The book contains many hundreds of black and white illustrations and thirty-two colored plates, all of which are excellent.

It can be highly recommended to the practitioner who will find in this book much valuable information; to the specialist, who will find it very interesting; and, last but not least, to the medical student for whom it may be somewhat large and expensive.

E. A. STRAKOSCH, M.D.

TUBERCULOSIS AMONG OLD PEOPLE

A definite increase in the number of old people dying from tuberculosis has occurred during the past few years. In the year 1940 almost one-fourth of the tuberculosis deaths in the City of Peoria, Illinois, were persons of sixty years or over. As is true the country over, in the age group of fifteen to thirty-four more women died than men. The hazards of puberty in the girls and the strain and stress of childbearing are chiefly responsible for this fact. The search for tuberculosis among young women offers a fertile field.—M. POLLAK, M.D., *Ann'l rep. Peoria Mun. Tuber. Sanatorium, 1940.*

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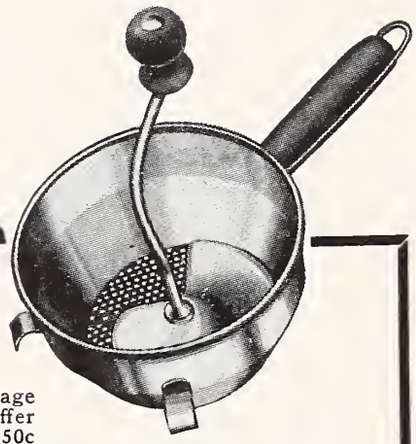
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THE ROLE OF TONSILS AND ADENOIDS IN RESPIRATORY INFECTIONS IN CHILDREN*

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Rochester, New York

RESPIRATORY infections in infants and in children comprise the most common group of illnesses for that age group. Statistical evidence points to a lowered mortality and morbidity rate from these diseases during the last ten years but no specific measures have been developed that assure reasonably certain control of these common infections. Though the common respiratory infections termed colds, sore throat or tonsillitis, laryngitis, bronchitis and pneumonia represent the usual manifestations in infants and in children, such complaints as otitis media, cervical adenitis and sinusitis must be considered as a part of or as sequelæ of respiratory infections.

Before assigning to respiratory infections any causative or influencing factors certain data pertaining to these infections must be recognized. Though children at all ages may contract any of the respiratory infections it has been demonstrated that all of these infections are most prevalent in the age grouping of three to seven years. It is also certain that geographical location and climatic advantages influence the occurrence of these complaints. These accepted facts must not be lost sight of when any single factor is considered that might influence the incidence or course of these respiratory infections in children.

Definite progress has been made in the control of respiratory infections. Advances in the science of nutrition, particularly with reference to vitamin and mineral needs, have played a part in developing resistance to respiratory infections. Epidemiological studies leading to a more intelligent handling of children have aided in this control. To immunological studies and recently to chemotherapy can be ascribed significant gains in the management of these common infections. For at least two decades there has been a strong conviction among the medical profession and in lay groups that the tonsils and the adenoids play a significant part in predisposing to or in prolonging these common infections in children. This belief accounts for an attitude to the tonsils and adenoids which may or may not be justified. It is important, therefore, to study this supposed contributing factor to determine if possible the rôle of the tonsils and adenoids in respiratory infections.

It is a logical assumption that the tonsils and adenoids are involved in upper respiratory infections and that infections reaching the larynx, the trachea, and the lungs may likewise involve the lymphoid tissue of the nasopharynx. The problem is to decide whether this relationship is one that encourages these infections or is detrimental to their development. A solution of the problem would direct the course that should be taken in the treatment of the tonsils and adenoids for the prevention and treatment of the type of infections under discussion.

Interest in the surgical treatment of the tonsils and adenoids increased when it was clearly demonstrated that marked hypertrophy of this lymphoid tissue interfered with normal and comfortable breathing. The removal of these organs brought about prompt relief and seemed to improve the general health of the treated children. With the improvement in surgical technique, more certain control of hemorrhage and safer anesthesia the removal of the tonsils and ade-

*Read at the annual meeting of the Minnesota State Medical Association, Saint Paul, Minnesota, May 28, 1941.

noids was suggested for reasons other than hypertrophy. Clinicians maintained that infection in the tonsils and adenoids could be present without evidence of hypertrophy. The reported beneficial results following tonsillectomy in selected cases with obvious infection stimulated similar treatment where the evidence of infection was not clear. Then followed an attitude of condemnation of the tonsils and adenoids in the school child as a possible predisposing factor in any of the infections of the oral cavities and the respiratory tract. In fact some fifteen years ago statements were made by observers that the tonsils and adenoids could serve no useful purpose and were quite likely to be a liability to any child. It was argued that infections of the nasopharynx and the respiratory tract were encouraged by the presence of the tonsils and adenoids and conversely that their absence reduced the incidence of such infections. If clinical experience based on sound observations had corroborated these reports there would be no need for this discussion today. It developed, however, that respiratory infections did occur frequently in children whose tonsils and adenoids were removed at various ages. From these conflicting reports the query naturally arose, Just what is the rôle of these lymphoid structures in respiratory infections? Seeking aid in the solution of this query a study was undertaken to look for some convincing evidence that might guide the physician in his attitude toward the tonsils and adenoids.

Mindful of the fact that no scientific evidence is at hand to explain the part the tonsillar tissue plays in the economy of the child, it became necessary to follow the development of a group of children to adolescence, recording the sequence and the number of their respiratory infections over a period of years. It was possible to follow a group of 4,400 children for a period of ten years, half of whom had had their tonsils and adenoids removed and the other half had not. The initial examination and the observation of these children began when they were between the ages of four and seven years and continued into their high school period. At the time of their initial examination the indications for tonsillectomy were numerous but in general about the same for the entire group of children. For various reasons only one-half of the total group (4,400) submitted to the operation so the unoperated children served as controls. The incidence and the trend of a particular type of infection was noted in each child whether in the operated or in the unoperated group.

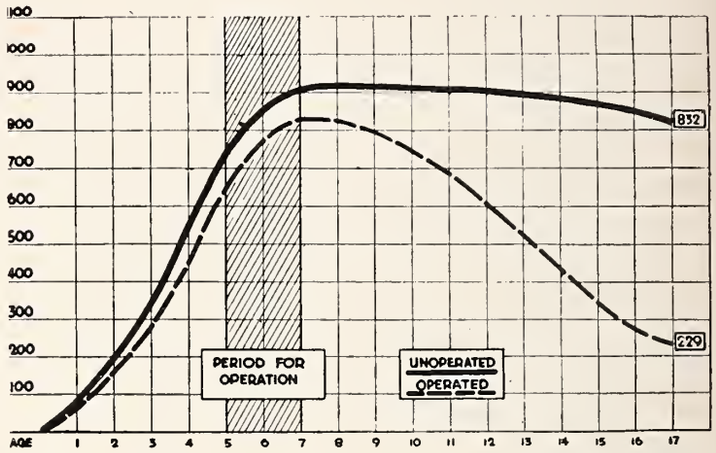


Chart 1. Tonsillitis and sore throat among 2,200 tonsillectomized and 2,200 non-tonsillectomized children.

Tonsillitis.—From these studies it was noted that tonsillitis was a common complaint in young children. Approximately 38 per cent of the 4,400 children utilized were subject to repeated attacks of tonsillitis (at least two febrile attacks a year) during the first seven years of life. As is indicated in Chart 1, the incidence of sore throat was decidedly lessened during the ten-year period. In the group in which the operation was not done, attacks of tonsillitis recurred with only a slight decrease in frequency during the same years. When one compares the incidence of this infection in the two groups it is obvious that the common ailment termed tonsillitis or sore throat occurred less frequently in the cases in which the tonsils had been removed. In other studies, notably those of Selkirk and Mitchell,[3] similar results were obtained as far as this complaint was concerned.

Common Cold.—The common cold (four colds or more a year) occurred with about equal frequency in the two groups under observation (Chart 2). Approximately 42 per cent of the children were subject to this repeated infection up to the age of seven years. Over the ten-year period the children who were operated on showed only a slight advantage over the children who were not, an advantage which cannot be considered statistically significant. It is quite likely that the removal of the adenoids benefited the younger children but as the children ad-

vanced in years the adenoid tissue retrograded, so that the children who were not operated on were likewise benefited. Though the trend as far as frequent colds are concerned is down-

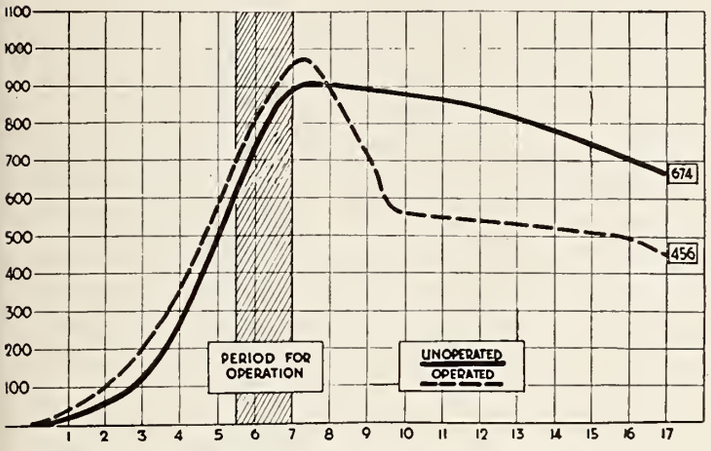


Chart 2. Colds (four or more a year) among 2,200 tonsillectomized and 2,200 non-tonsillectomized children.

ward as the child increases in age, there is insufficient evidence to show that the rôle of the tonsils is a significant one in either predisposing or preventing this common infection. Adenoids, especally if they are obstructive, do play a significant part in predisposing to colds in young children but less so in older children.

Otitis Media.—Otitis media may exist independent of a respiratory infection but in many instances it occurs coincident or as a sequela of other oral infections. Only purulent otitis media

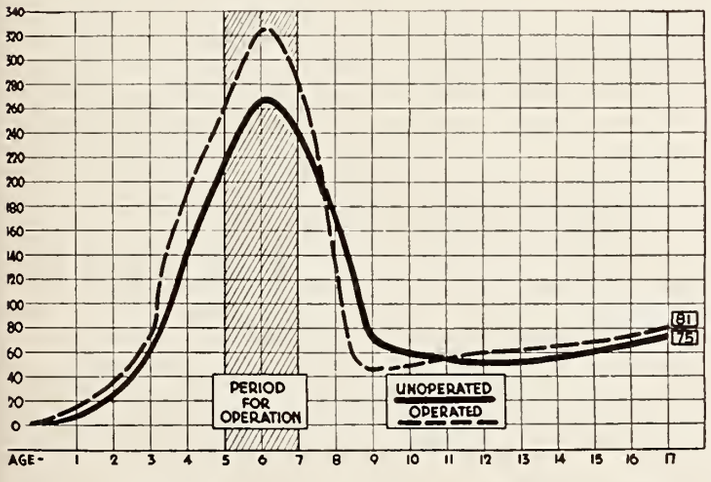


Chart 3. Otitis media (purulent) among 2,200 tonsillectomized and 2,200 non-tonsillectomized children.

was considered in a study of this infection. It was noted that 15 per cent of the children who were subsequently operated on had suffered from purulent otitis media before the ages of from five to seven years, while in the control group 12 per cent were likewise affected. During the three-year period following the tonsil and adenoid operation the incidence of otitis media was considerably lower in the operated group than in the unoperated children. It seems likely that the removal of the adenoids was responsible for this advantage for during the next seven years the unoperated children fared as well and even a little better than those who were operated on. The age factor must be considered in evaluating the rôle of the tonsils and adenoids in this infection for regardless of the presence or absence of the tonsils this type of infection becomes less frequent after the eighth year of life. From these observations one can conclude that the tonsils play an insignificant rôle in the production of otitis media but that the adenoids may influence the incidence of this infection in children between three and eight years of age (Chart 3).

Cervical Adenitis.—Cervical adenitis in children is usually secondary to a nasopharyngeal infection. It was noted that in each group, operated and control, 15 per cent of the children had

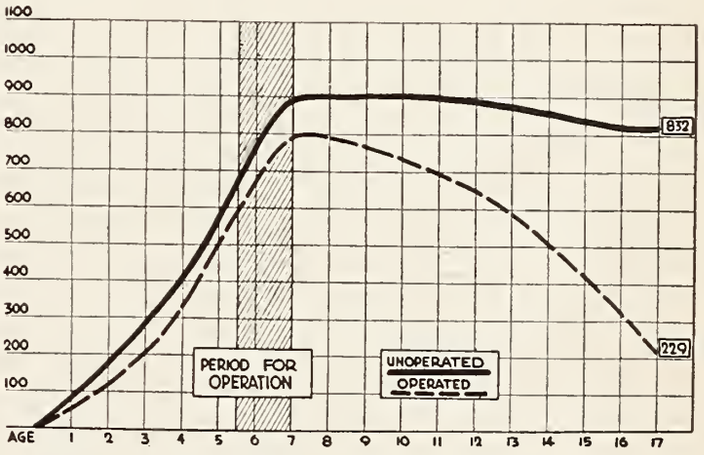


Chart 4. Cervical adenitis (acute and chronic) among 2,200 tonsillectomized and 2,200 non-tonsillectomized children.

definite enlargement of the cervical glands before the ages of five to seven years. Only children in whom there was a visible enlargement of the cervical glands have been considered. During the three-year period following tonsillectomy the incidence of cervical adenitis in the children who were operated on was 5 per cent as compared to an incidence of 14 per cent in the children who were not. Over a longer period of time a number of the tonsillectomized group showed a recurrence of cervical adenitis, accounting for an incidence of 7 per cent at the end of ten years,

while among the children used as controls the incidence of this complaint was 14 per cent. The statistical evidence in this study as well as in other reported studies shows a significant favorable trend for the relief of this complaint in the groups in which a tonsillectomy had been done (Chart 4).

Sinusitis and Nasal Allergy.—Children with acute sinusitis, nasal allergy and allergic involvement of the sinuses are not favorably influenced by tonsillectomy. These conditions develop with equal frequency in children whose tonsils and adenoids have been removed in early childhood and in untreated children. The surgical removal of the tonsils and adenoids rarely benefits this condition. Observations made by Bullen[1] and recently by Hansel and Chang[2] indicate that the rôle of the tonsils and adenoids is not an important one in the causation and treatment of these manifestations.

Laryngitis.—Recurrent laryngitis occurred in 3 per cent of the children before the operation and in 5 per cent of the children in the control group over the same period of time. For the three-year period following tonsillectomy the incidence was not changed in either group. At the end of the ten-year follow-up period, 8 per cent of the children operated on were subject to recurrent attacks of laryngitis, while 10 per cent of the children used as controls were similarly affected. There is no obvious change in the incidence of this infection after the removal of the tonsils and adenoids and it would seem that the rôle of the tonsils and adenoids is not an important one in the occurrence of this infection.

Bronchitis and Pneumonia.—In the case of upper respiratory infections the tonsils and adenoids are usually involved if they are present. In pulmonary infections these lymphoid structures may or may not be involved depending upon whether the pulmonary infection is primary or secondary to an upper respiratory infection. It is of interest, however, to discover, if possible, whether bronchitis and pneumonia occur less frequently or more frequently after the tonsils and adenoids have been removed. In analyzing the two groups it was found that pulmonary infections occurred more frequently in children during the first five years of life than in the next ten years. Such is the usual incidence of these infections. Undoubtedly some children subject to pulmonary infections are operated on because of this tendency, for more of the children who underwent the operation had repeated

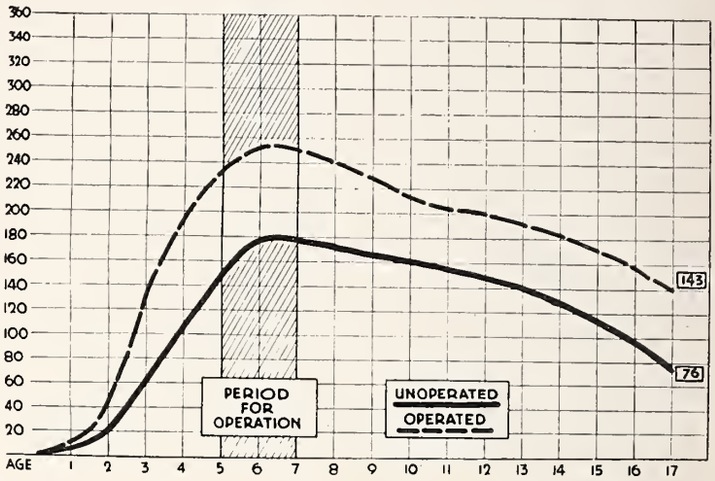


Chart 5. Pulmonary infections (bronchitis and pneumonia) among 2,200 tonsillectomized and 2,200 non-tonsillectomized children.

attacks of bronchitis and pneumonia before the ages of five and seven years than in the group of children who were never operated on. In spite of this, the trend was definitely for more pulmonary infections in the tonsillectomized group over the ten-year period than for the control children (Chart 5).

It seems that the absence of the tonsils either increased the chances of developing bronchitis and pneumonia or else the tonsillectomized group represented the more susceptible individuals and the operation was not responsible for the increased incidence of pulmonary infection. There seems to be no evidence to show that the tonsils and adenoids predispose the child to a pulmonary infection. There is suggestive evidence that the absence of the tonsils may encourage pulmonary involvement due to the fact that the soil in which bacteria might develöp has been removed in the oral cavity.

When one reviews the statistical data dealing with the various infections it is quite evident that one can only talk about trends rather than what happens in an individual case. From clinical experience it is well known that the tonsils and adenoids play a very significant rôle in predisposing to respiratory infections but can one deduce from these isolated results that the rôle of the tonsils is the same in all children. If it were so the trends brought out by these statistical studies would be much more favorable for the

operated group than our analysis shows. It can be assumed, however, that a favorable trend for a given infection in either group denotes the rôle the presence or the absence of the tonsils play in the incidence of that infection. With that interpretation of the results it is clear that the tonsils and adenoids do play a significant rôle in the incidence of the upper respiratory infections while in the case of pulmonary infections the presence of the tonsils does not increase the incidence of bronchitis and pneumonia.

Recent advances in the treatment of respiratory infections may alter our opinion as to the significance of the tonsils and adenoids in these infections. The improved dietary factors which are now assured a large percentage of the children and the general use of sera and effective drugs in the treatment of respiratory infections have brought about a favorable effect on the morbidity and the mortality in these infections. The incidence and severity of respiratory infections has been shown to be less in adequately fed children than in children with known deficiencies in diet. The use of anti-pneumococcus serum and such drugs as sulfapyridine and sulfathiazole have materially reduced the mortality of pneumonia in children. Consequently, the rôle of the tonsils and adenoids appears to be less important than during the period when no specific remedies were available. The control of the respiratory infections cannot be considered accomplished, however, unless measures are developed that assure some degree of protection against the infection. It is in the field of prevention that the tonsils and adenoids may play an important rôle. One can, therefore, interpret the findings in this study as of significance in reducing the incidence of upper respiratory infections even though their removal does not tend toward a lower incidence of pulmonary infections.

Discussion

After making due allowance for the various procedures that are known to influence the incidence and the treatment of respiratory infections in children the evidence gathered from this study does indicate that there is a relationship between the tonsils and adenoids and respiratory infections. If one separates these manifestations into upper and lower respiratory infections it is clear that removal of the tonsils and adenoids favorably influences occurrence of upper respiratory infections and does not favorably influence that of the lower or pulmonary infections. It is probable that the presence of the tonsils may even act as a safeguard against pulmonary infection inasmuch as the unoperated children showed somewhat less incidence of bronchitis and pneumonia. The measurable benefits of tonsillectomy and adenoidectomy to the children who have been subject to tonsillitis, colds, otitis media and cervical adenitis, justify the operation in these children and is a desirable procedure. The benefits, however, though striking in the case of tonsillitis and cervical adenitis, are not great enough to advocate a prophylactic tonsillectomy in children with the idea of reducing the incidence of respiratory infections. The statistical evidence agrees with the general clinical experience that certain types of upper respiratory manifestations can be reduced if the tonsils and adenoids are removed but other manifestations may actually occur more frequently following the operation. The type of respiratory complaint to which the child is most susceptible must determine whether the tonsils or the adenoids are likely to be a liability to the child. From clinical experience and from a study of the statistical evidence some idea is obtained as to the rôle of the tonsils and adenoids in the case of a specific complaint. Where the rôle of the tonsils and adenoids appears to be favorable to the production of clinical symptoms the surgical removal of the tonsils is advocated.

Conclusions

The tonsils undoubtedly are responsible for many upper respiratory infections especially in children subject to tonsillitis and to cervical adenitis and can be considered as playing an important rôle in these infections. Tonsillectomy is desirable in such children.

The adenoids appear to be a causative factor in some children who develop frequent colds and middle ear infections. In the age period of three to seven years the adenoid structures are particularly a menace to many children and their removal does assure some protection against similar recurrent attacks. Adenoidectomy is advised in such children either alone or along with a tonsillectomy.

For the relief and protection against sinusitis and nasal allergy no statistical evidence is avail-

able to justify any protection by either the removal of the tonsils or adenoids or both organs. In the production of these clinical manifestations the tonsils and adenoids seem not to play any significant part.

Evidence obtained in this study does not support the opinion that laryngitis, bronchitis and pneumonia can be reduced in incidence by removing the tonsils and adenoids. It appears that laryngeal, bronchial and pulmonary infections are not dependent upon the presence or absence of the tonsils and that these lymphoid structures do not play a significant rôle in lower respiratory diseases.

Improved hygienic and dietary measures along with successful specific therapy in pulmonary diseases have brought about a condition which justifies the statement that is now generally accepted that the rôle of the tonsils and adenoids in the average child is not as important today in the control of respiratory infections as was thought to be the case a decade or two ago.

16 N. Goodman St.

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APPARENT SPREAD OF POLIOMYELITIS THROUGH FOUR FAMILIES*

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OF RECENT years there has seemed to be a tendency for some individuals in authoritative positions to deny the possession of any knowledge concerning the mode of transmission of poliomyelitis. This is somewhat surprising in view of the brilliance of the minds which have been devoted to this problem since the turn of the century, but it makes it imperative, nevertheless, that the entire subject be reviewed in a critical manner. It behooves those who possess pertinent data, therefore—data which have not been presented heretofore because of the belief that the matter was largely settled and that such presentation would not contribute materially to the problem—to make available this information so that it may at least be added to the evidence already presented and be taken into consideration in the critical re-appraisal. For these reasons, it may perhaps not seem too inappropriate to present data ten years old.

There are one or two aspects of the investigation of the poliomyelitis outbreak in Minnesota in 1930 which, perhaps, make it of somewhat more value than would otherwise be the case. The advantages of making epidemiological investigations in rural areas is well known, and this outbreak occurred in a very rural area. The cases were confined chiefly to the southwestern corner of the state, an area in which there are no large cities and in which, for the most part, people live on isolated farms considerably separated from one another. This isolation was even more complete in 1930 than it is today. Although automobiles were in wide use, they were not used to the extent that they are now, and there was less mingling of farmers' families with others in the vicinity. There were no paved roads in southwestern Minnesota at that time, and only the main highways were even gravelled. As a result of these factors, a visit or a visitor was a red letter event for the farmer's family, and the names of the visitors, places visited, and dates, usually could be given accurately.

There is one other factor involved in the investigation of this particular outbreak which probably should be mentioned, merely because it, too, has some bearing on the reliability of the data. This is that it was my first assignment in public health work. I accepted the task, therefore, with some trepidation, but at least with no preconceived ideas as to the epidemiology of poliomyelitis and with great zeal born of my desire to make good.

Another point of some importance is that essentially all of the investigation was conducted by one person. There were no county or district

*Presented before the Society for the Study of Mass Medicine, December 16, 1940.

†Formerly Epidemiologist, Division of Preventable Diseases, Minnesota State Department of Health.

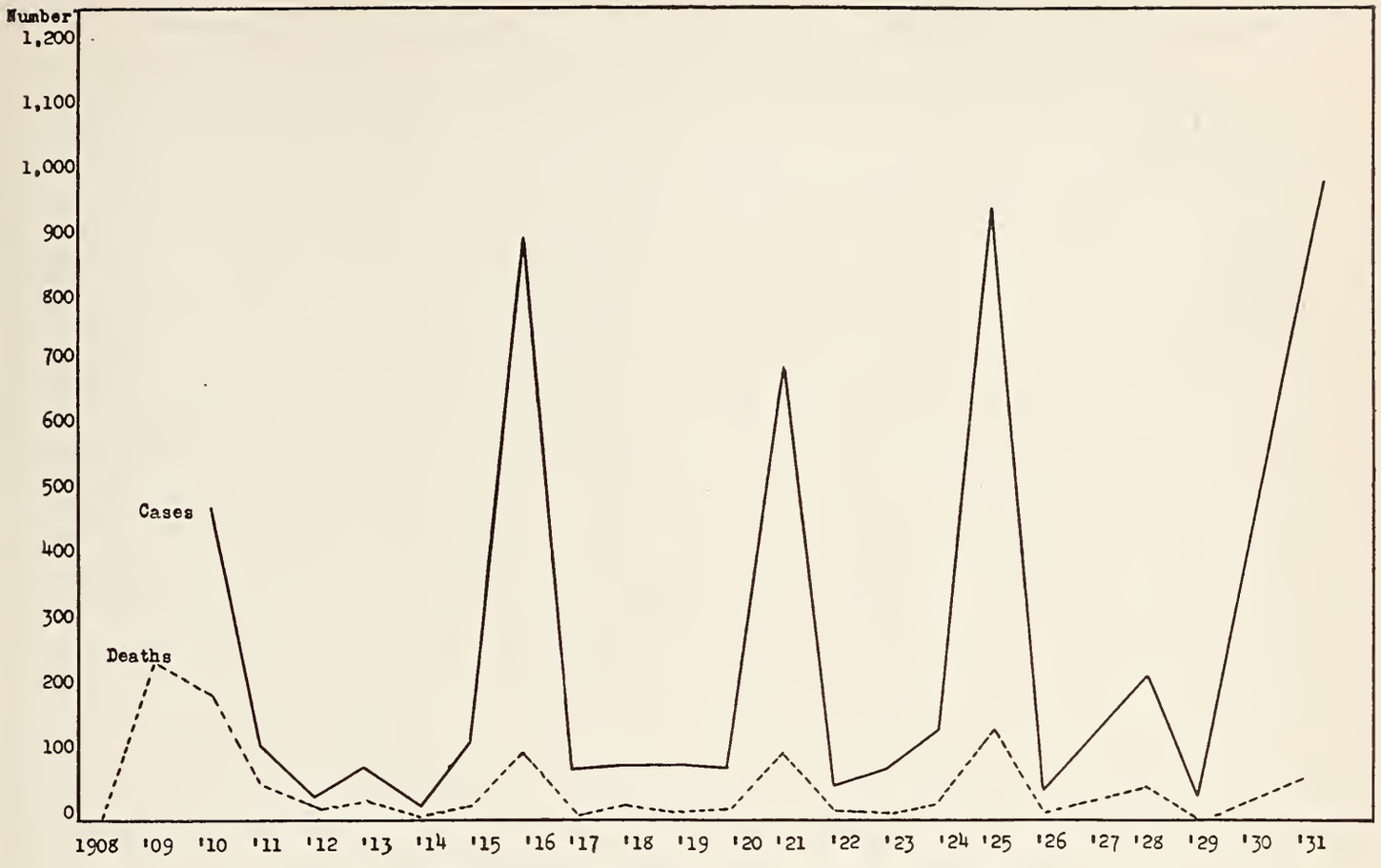


Fig. 1. Poliomyelitis—reported cases and deaths in Minnesota, 1908-1931.

health officers. Theoretically, all townships were supposed to have health officers but in very few of them had such appointments actually been made. Only in the larger villages had physicians been appointed to act as part-time health officers. Essentially all of the investigating that was done was therefore conducted by me, and I spent practically the entire summer of 1930 in southwestern Minnesota for this sole purpose. Of the 166 cases reported in this area up to September first, 155 were investigated by me personally. The central office kept me informed of cases by phone or wire as they were reported and I was free to investigate as thoroughly as I could, being limited only by my own industry and the number of hours in a day.

This report, then, is a very earthy one coming under the classification of "sole leather" epidemiology; or more correctly, in this instance, "flivver" epidemiology.

Before proceeding further, it may be well to give a few definitions. Three types of cases will be considered: (1) paralyzed cases: cases with demonstrated paralysis or weakness of muscle groups; (2) non-paralyzed cases: cases with the usual systemic symptoms, with findings indicating central nervous system involvement (such as resistance to anterior flexion of the neck and back, or an abnormal increase in the cell count of the spinal fluid), but without any demonstrated paralysis; and (3) suspicious cases: cases of illness in households in which paralyzed or non-paralyzed cases of poliomyelitis had occurred, and with symptoms similar to the systemic symptoms of poliomyelitis, but with no evidence of involvement of the nervous system. I have purposely avoided the use of the term "abortive" since sometimes it is used to refer to cases I have designated as "non-paralyzed," and sometimes to cases I have designated as "suspicious." If the term "poliomyelitis" is used without further modification it refers to "paralyzed" and "non-paralyzed" cases combined, but exclusive of "suspicious" cases.

By "southwestern" Minnesota I refer to the twelve counties in the extreme southwestern corner of the state, four across and three deep. The most southern tier of this group, from west to east, are Rock, Nobles, Jackson, and Martin Counties. The middle tier, in corresponding order, are Pipestone, Murray, Cottonwood, and Watonwan Counties, and the northern tier, Lincoln, Lyon, Redwood and Brown Counties.

Minnesota's Prior Experience With Poliomyelitis

Minnesota's experience with poliomyelitis prior to 1930 is indicated in Figure 1. It is evident from this figure that Minnesota had experienced an epidemic of poliomyelitis roughly every four to six years since 1909. The largest epidemic of all probably occurred in 1909, judging by the number of deaths (234, resulting in a mortality rate of 11.47 deaths per 100,000 population). The last large epidemic prior to 1930 occurred in 1925, and it is probably significant that southwestern Minnesota was spared to a large extent in this epidemic, with only 43 of the 941 cases occurring in this area. It has been a common observation in Minnesota that the same area is not heavily attacked in two successive epidemics. During the four years, 1926 to 1929 inclusive, only 18 cases of poliomyelitis were reported from southwestern Minnesota. In 1930, however, 222 cases were reported in this area, accounting for almost half of the 480 cases reported in the state as a whole that year.

General Characteristics of the 1930 Epidemic

The 1930 poliomyelitis outbreak was a perfectly typical one, although it proved to be just a preliminary increase in case incidence which went on to an even more extensive epidemic the following year, as indicated in Figure 1. The 480 cases amount to a morbidity rate of 18.7 per 100,000 population. Thirty-seven poliomyelitis deaths were reported that year, giving a case fatality rate of 7.7 per cent, or a mortality rate of 1.25 per 100,000 population. The usual predominance of cases among males occurred with a ratio of male to female cases of 1.46. As to the age distribution, 24 per cent of the cases occurred in individuals under five years of age.

Development of the Epidemic in Southwestern Minnesota

Considering the epidemic only from the standpoint of southwestern Minnesota, the earliest case I was able to discover had onset on April 8 and occurred in a child in Worthington, Nobles County, a city of about 4,000 population. Worthington is considered the focus of the epidemic, although two cases with onsets April 10 and 12 occurred in Bloom and Wilmont Township, respectively, about fifteen miles from Worthington, and with no ascertainable connections, so that it is difficult to state exactly where the epidemic actually started. However, the persistence and high incidence of the infection in Worthington, together with the important rôle this city plays in the social and economic life of Nobles County and beyond, further justifies considering this city as the primary focus.

The Division of Preventable Diseases did not know of any cases of poliomyelitis in this vicinity until after the first of June, and yet definite clear-cut cases were discovered with onsets going back to the early part of April. When I saw the first cases upon my arrival, and told the physician that I was positive they were cases of poliomyelitis, he remarked, "Well, if this is poliomyelitis, I've seen lots of others!", and proceeded to give me names of other patients seen by him in the recent past which, upon investigation and examination, left no doubt that they, too, actually were cases of the disease. A similar experience was encountered in each new community from which poliomyelitis was reported. The first cases reported were usually very severely paralyzed patients, and the physicians would not feel too sure that even they were cases of poliomyelitis. As the physicians became aware of the presence of the disease in their community, however, they improved in their diagnoses, progressively diagnosing cases as poliomyelitis with less and less severe degrees of paralysis.

Radial Spread

I had never heard at the time of the radial spread of poliomyelitis, but this well demonstrated characteristic of the disease, so difficult to explain other than by transmission through person-to-person contact, became very evident. At first my work was confined entirely to the Worthington area, and then I began to describe a wider and wider arc in visiting new cases reported, at the same time visiting fewer and fewer cases in the area of the original focus. Toward the end of the summer I found myself covering about two hundred miles a day to keep up with the new cases appearing on the ever-widening periphery of the outbreak, and felt very much like the end man in a game of "crack-the-whip."

This radial spread is evident from Figure 2,

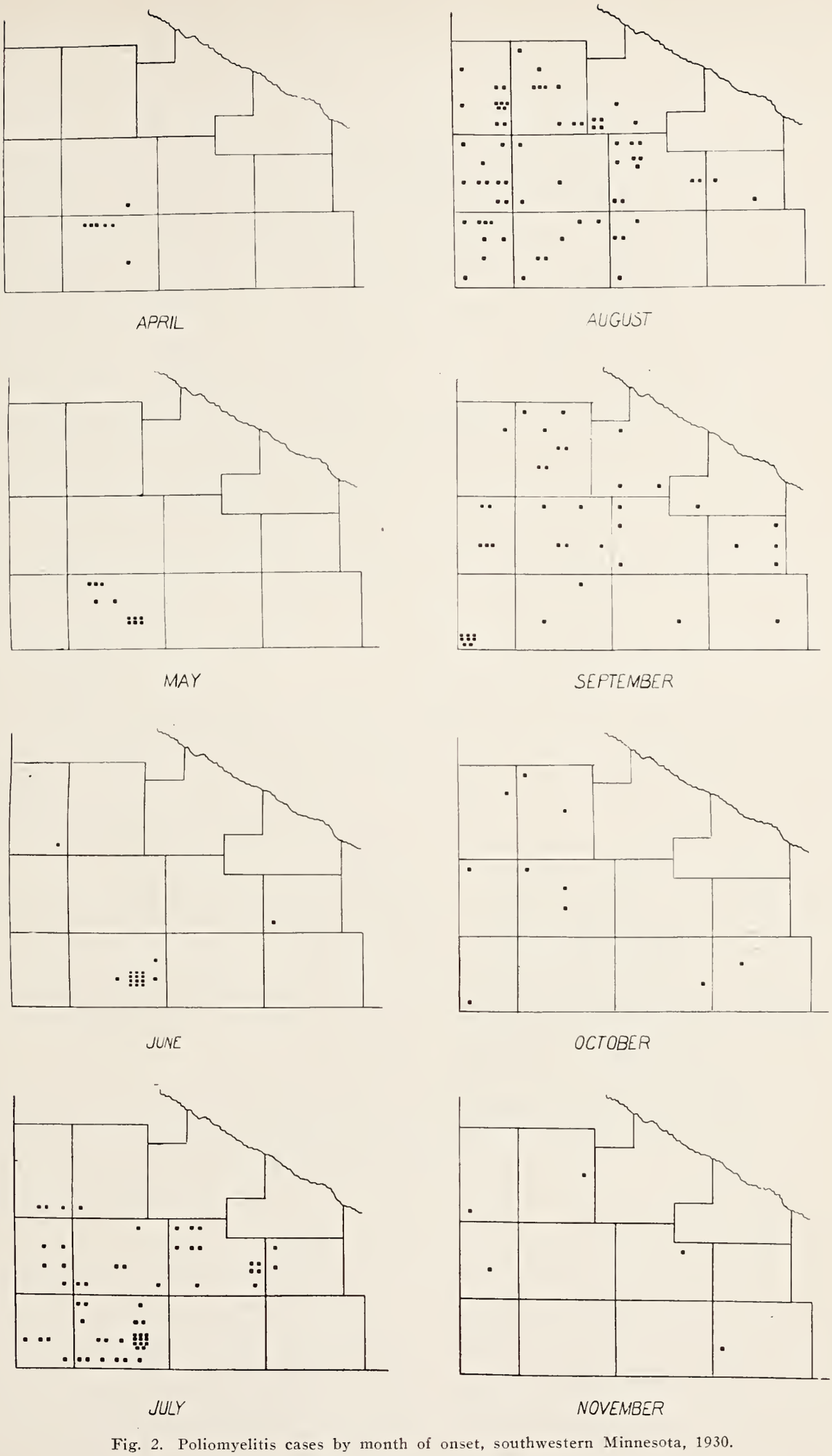


Fig. 2. Poliomyelitis cases by month of onset, southwestern Minnesota, 1930.

TABLE I. REPORTED CASES OF POLIOMYELITIS IN MINNESOTA IN 1930
(According to month of onset and area)

Month	Number of Cases Reported From:					Rate per 100,000 Population†				
	Worthington	Southwestern Minnesota			Minnesota exclusive of Southwestern Minnesota	Worthington	Southwestern Minnesota			Minnesota exclusive of Southwestern Minnesota
		Zone I*	Zone II	Zone III			Zone I*	Zone II	Zone III	
Jan.					1					
Feb.					2					0.1
Mar.					2					0.1
Apr.	1	6	1			25.8	32.2	1.5		
May	6	11			1	154.7	59.1			
June	11	16	1	2		283.7	85.9	1.5	1.8	
July	10	26	27	6	4	257.9	139.6	39.9	5.5	0.2
August		6	36	28	36		32.2	53.1	25.5	1.5
Sept.		2	22	17	60		10.7	32.5	15.5	2.5
Oct.			6	4	102			8.9	3.6	4.3
Nov.			2	3	36			3.0	2.7	1.5
Dec.					14					0.6
Total	28	67*	95	60	258	722.1	359.7*	140.4	54.6	10.8

*Including Worthington cases.

†1930 populations: Worthington 3,878
Zone I 18,618
Zone II 67,747
Zone III 109,880
State, excl. of S. W. Minnesota..2,367,708

and also may be shown by the usual device of dividing the area into concentric zones and comparing the waxing and waning of cases in the various zones. This may be done in this instance by dividing southwestern Minnesota into three zones, with Nobles County serving as Zone I, the counties immediately adjacent to Nobles County serving as Zone II, and the counties adjacent to them in turn serving as Zone III, as indicated in Figure 3.

The cases, according to onset by months, reported from Worthington from each of the three zones, and from the state exclusive of southwestern Minnesota, are presented in Table I.

These data are presented graphically in Figures 4 and 5. From Figure 4 it may be seen that through July southwestern Minnesota accounted for essentially all of the cases. However, the cases in this area reached their peak in August and rapidly declined, while the epidemic for the state as a whole didn't reach its peak until October.

Figure 5 clearly depicts the wave-like spread from the primary focus, and the decrease in amplitude of the wave (morbidity rate) as it rolled outward.

For comparison with a disease in which respiratory spread is unquestioned, Figure 6 is presented giving Syracuse measles morbidity rates in 1927 for the months of epidemic prevalence by census tracts, with the tracts grouped into concentric zones. Zone I is the area of the city in which measles first appeared. The 1927 figures were selected because the data happened to be readily accessible and the fact that only one focus seemed to be involved throughout that year. Occasionally, in other years, additional foci have appeared later in the epidemic and the collision of waves spreading radially from these multiple foci result in a confusing picture when morbidity

rates are calculated by zones for the city as a whole. It will also be noted the measles cases are by date of report rather than by date of onset, but since the lag between onset and report was undoubtedly uniform this should not make any difference in the pattern. The rough similarity of Figures 5 and 6 is evident.

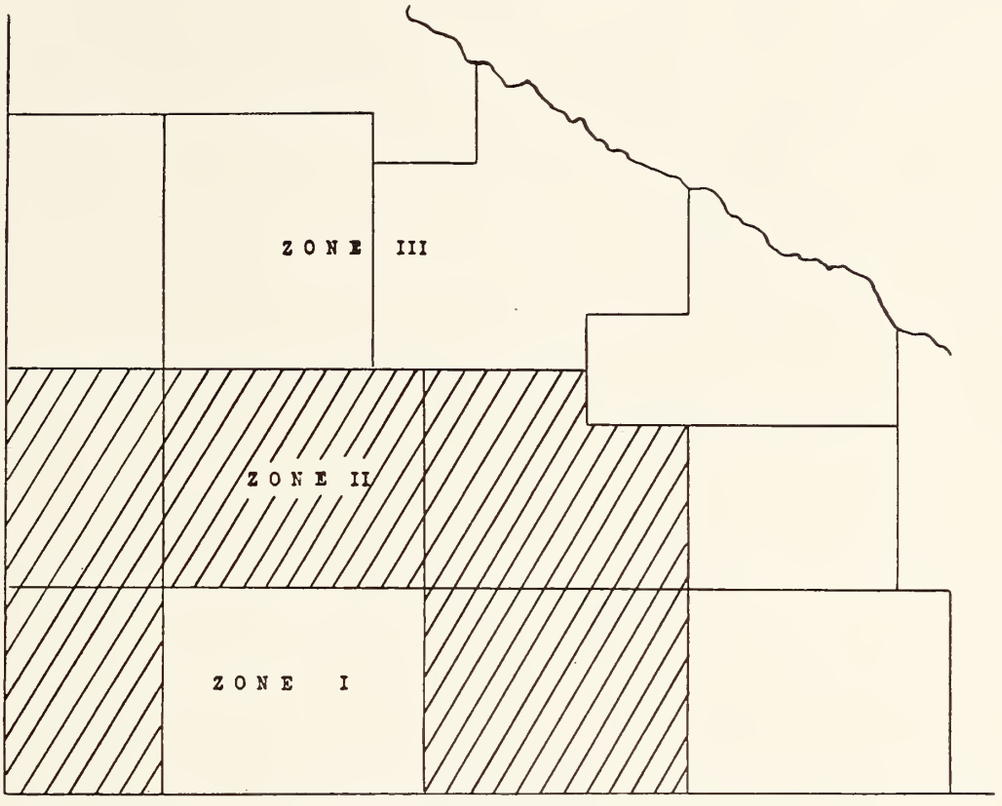


Fig. 3. Division of southwestern Minnesota into zones for statistical purposes.

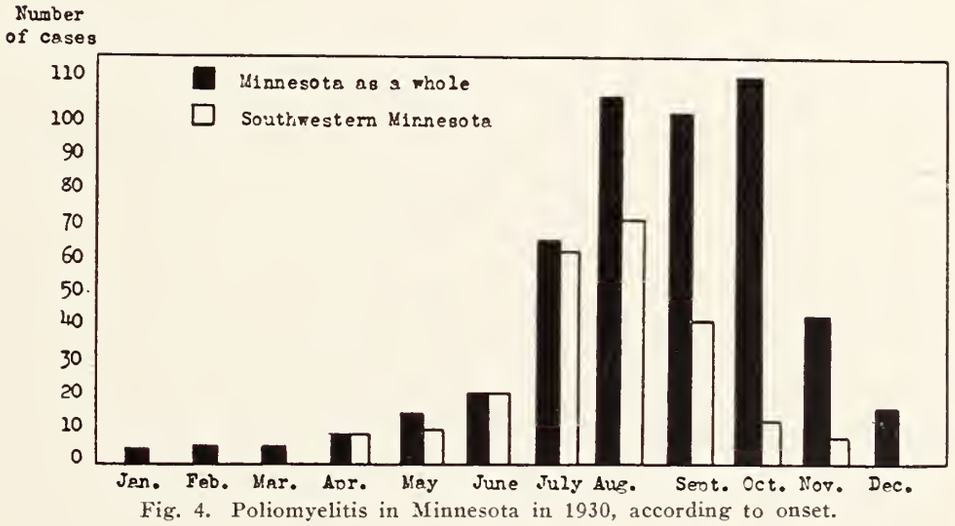


Fig. 4. Poliomyelitis in Minnesota in 1930, according to onset.

Direct Evidence of Spread Through Contact

As stated previously, I investigated 155 of the 166 cases occurring in southwestern Minnesota up to September 1. I also investigated 11 other cases elsewhere in the state, and the remainder of the paper will be devoted to some of the findings in my investigation of these 166 cases.

Investigation included a clinical history and physical examination of each patient diagnosed poliomyelitis, a detailed history as to activities and contacts during the period extending back thirty days prior to first symptoms in the earliest case, and a complete household roster with a history of any illness in other members of the household. Whenever possible, physical examinations were made as well of household members giving a history of a suspicious illness.

Soon after the investigation was started it became perfectly apparent that there were all gradations of illness. So far as involvement of the nervous system was concerned, cases ranged from fatally paralyzed cases, on through cases with but a mild temporary weakness of one or two muscle groups, to cases in which the patient merely complained of pain upon anterior flexion of the neck. In addition, many individuals were found to suffer from general systemic symptoms similar to those in the definite cases, but with no apparent involvement of the nervous system. These latter cases were usually self-designated as "summer flu," or "stomach flu." It was interesting to note that as poliomyelitis appeared in new communities the physicians reported a concurrent wave of "summer flu."

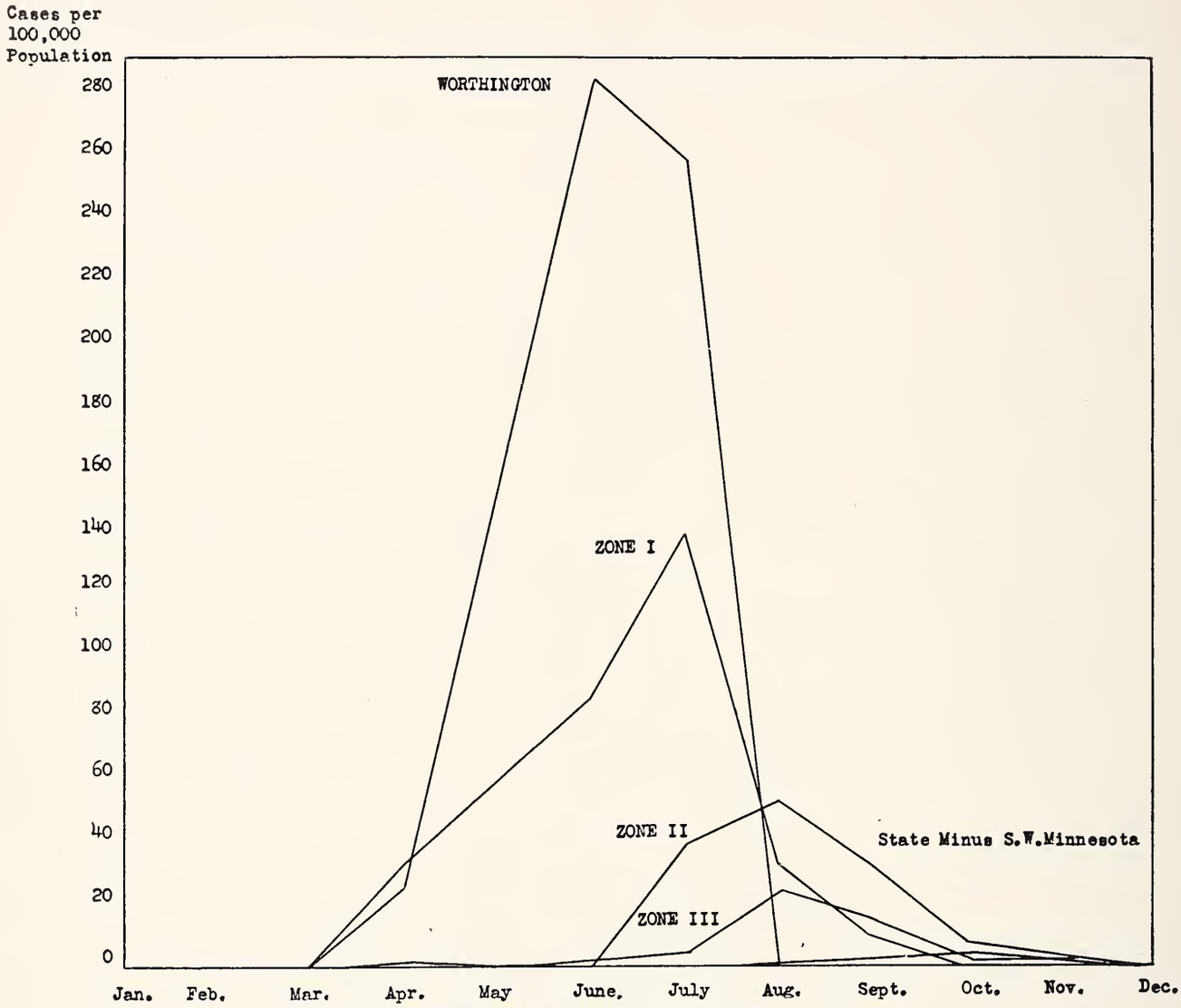


Fig. 5. Poliomyelitis in southwestern Minnesota in 1930.

The usual story from a mother in a family with a number of children in which poliomyelitis appeared was somewhat as follows: "Mary was ill for a couple of days; didn't want to play, complained of a headache, threw up once, and she seemed to be running a little fever. A few days after she got well, Johnny became sick the same way and we thought that he, too, merely had 'summer flu.' A couple of days later, however, he fell when he got up to go to the bathroom. We thought that he had just tripped on the rug, but later the same day, when he again got out of bed, he fell to the floor and couldn't get up. Then we saw he couldn't use one leg the way he should, so we called Dr. Smith and he said it was infantile paralysis." It seemed difficult to believe that the illnesses associated so frequently in households with paralyzed and non-paralyzed cases were not of the same etiology, and when it was assumed that they *were* manifestations of infection with poliomyelitis virus, a definite connection of one paralyzed case with a prior case could frequently be traced. Even considering only paralyzed and non-paralyzed cases, in fifty-three of the 166 cases investigated, or 32 per

cent, a history was secured of exposure within thirty days prior to onset to another acute paralyzed or non-paralyzed case.

There were several experiences which were so striking that they left little doubt in my mind that personal contact was an important factor in the usual spread of the disease. One was the investigation of a case of poliomyelitis occurring in a University of Minnesota student. This young man was the only University student to develop poliomyelitis in 1930. Investigation revealed that on Decoration Day, May 30, he attended a family reunion in a village half-way between Minneapolis and Worthington. This reunion was also attended by this young man's three-year-old nephew from Worthington, where the epidemic of poliomyelitis was already well under way. On that day, the nephew had first symptoms of what ultimately proved to be a typical case of paralytic poliomyelitis. The student was particularly fond of this nephew and played with him throughout the day. He then returned to Minneapolis and became ill June 12, developing a deltoid muscle paralysis.

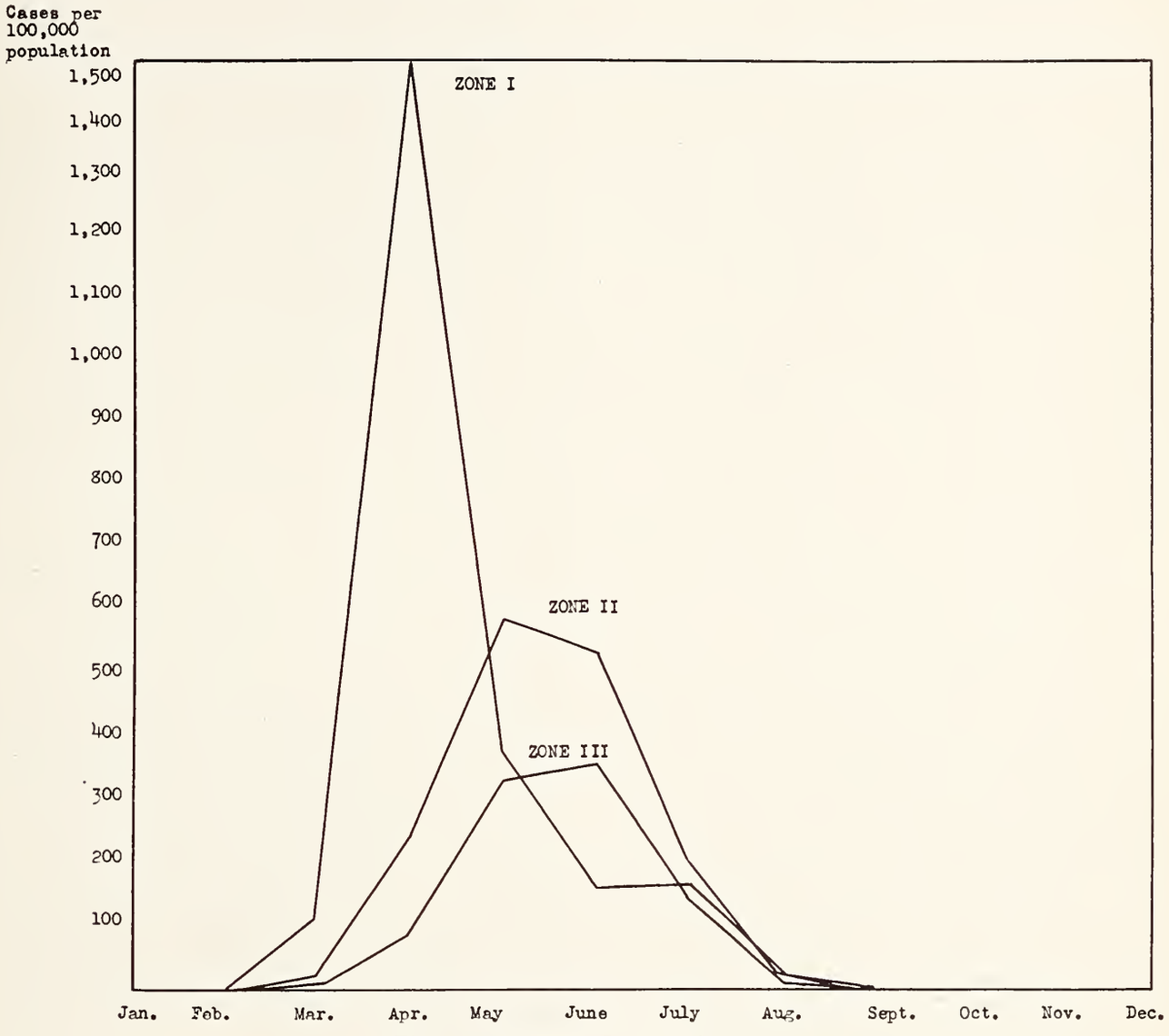


Fig. 6. Measles in Syracuse in 1927.

Another instance was the occurrence of paralyzed and suspicious illnesses among four related families (Fig. 7). The Ed L., Pete L. and K. families all had farms in Murray County, Moulton Township. The farms were not far apart and the families frequently visited back and forth. The first case to appear was in C. L., a typical paralyzed case with onset July 3. Her brother, J. L., also developed a typical case of paralytic poliomyelitis with onset July 17. Her older sister, Mrs. K., became ill with a suspicious illness about July 17, and Mrs. K.'s daughter, E., developed a typical case of paralytic poliomyelitis with onset July 21. About this same time, M. L., of the Pete L. family, and her guest, N. DeG., both developed suspicious illnesses. N. DeG. re-

turned to her home in the adjacent county on July 24, and on July 29 all three of her siblings became ill, with her brother, H. DeG., developing a typical case of paralytic poliomyelitis.

A third instance was the apparent spread of

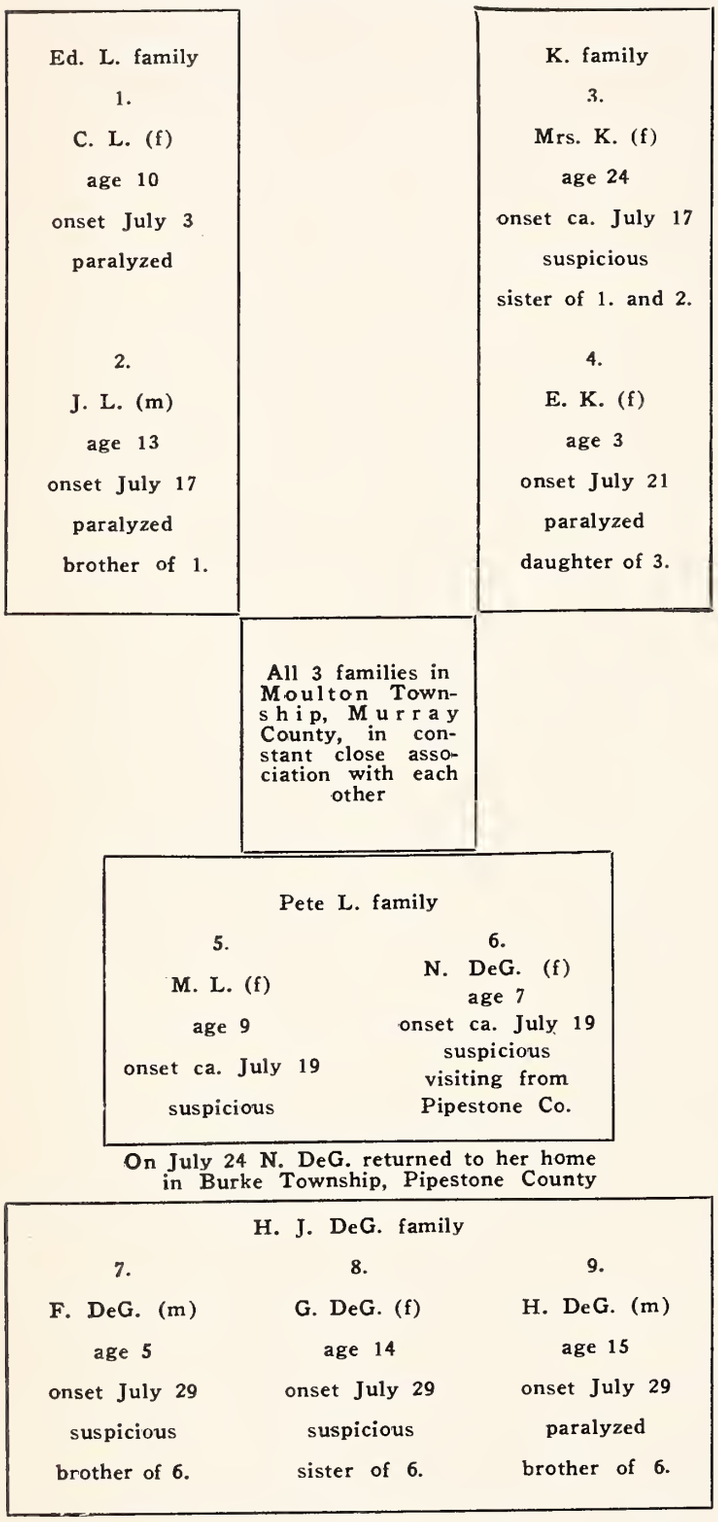


Fig. 7. Apparent spread of poliomyelitis through four families.

poliomyelitis from a county in the western part of Zone II of southwestern Minnesota to a county beyond the northern part of Zone III. The actual working out of the associations involved in this series was fascinating. Prior to the reporting of poliomyelitis in twins (males, aged nineteen months) from Osceola Township, Renville County, essentially all of the cases had been confined to southwestern Minnesota. These two cases, however, were distinctly beyond the focus of that time. In spite of questioning and cross-examining, I could not shake the mother from her assertion that the twins had not been away from the community at any time during the entire summer and that they had had no visitors. I recalled, however, that in a prior investigation of cases in a family in the village of Holland (in the focus), I had secured a history to the effect that after known exposure to poliomyelitis, the family had gone on an automobile trip toward the center of the state, and that while away on this visit, one of the children, a boy, A. N., aged nine, had become ill on July 20, causing the family to return home. This child developed a typical paralytic case of poliomyelitis. I, therefore, drove the 109 miles back to Holland Village and re-interviewed this family, inquiring exactly as to where they had been on their auto trip. I shall never forget the thrill I received as the mother gave me directions to reach the farm where they visited, for in telling me to take a certain new highway, fork on to the old highway at a certain point, turn left at the end of this road where a meeting house was located, et cetera, she was giving me directions leading directly to the farm of the twins! But she stopped one farm this side. I then dashed back to the farm where this family had visited and learned that two children on the farm, a girl, E. B., aged eight, and a boy, R. B., aged seven, had become ill about July 25, after the visitors from Holland Village had left. Their younger sister, G. B., aged three, who had been away on a visit, was brought back to the farm just prior to the development of the illnesses in her brother and sister, and about August 1, she, too, became ill. All three of the illnesses were called by the family "summer flu," but the boy, R. B., gave a history of having difficulty in walking for a period following his illness, and on the strength of this history, his case is considered one of paralytic poliomyelitis. The twins had been brought over by their mother to this neighboring farm to visit, and had played with G. B., right at the time of her illness. About a week later the twins became ill, both on the same day, August 7. One developed paralysis of the left leg, and the other paralysis of the right deltoid muscle.

This series is of particular interest because if

one investigator had not investigated both the Holland Village family and the Renville County cases and had not obtained and remembered the history of an automobile trip by the former to the general vicinity of the latter, the connection between the two would not have been discovered. If the association had not been determined, these cases in the twins might very well have been held up as examples of poliomyelitis suddenly appearing in a community in which there had been no poliomyelitis previously, and occurring on an isolated farm among children who had not been away all summer and who had had no visitors.

TABLE II. SEX AND AGE DISTRIBUTION

(Paralyzed, non-paralyzed and suspicious cases of poliomyelitis among members of 157 households in which paralyzed and non-paralyzed poliomyelitis cases occurred.)

Age Group	Number in households		Number of Cases					
			Paralyzed		Non-paralyzed		Suspicious	
	Male	Female	Male	Female	Male	Female	Male	Female
0– 4	64	58	22	13	1	2	18	14
5– 9	74	73	19	15	5	3	25	33
10–14	81	58	17	12	9	3	22	17
15–24	90	79	21	11	5	2	9	15
25–49	121	133	2	3	0	1	8	13
50 and over	32	15	0	0	0	0	0	0
All ages	462	416	81	54	20	11	82	92
Total	878		135		31		174	

Suspicious Illnesses in Household of Poliomyelitis Patients

The suspicious illnesses occurring in households with paralyzed or non-paralyzed cases of poliomyelitis are of particular interest, and one may inquire as to whether or not, in the absence of laboratory work to detect the presence of virus in these cases, there is any epidemiological data which may suggest whether or not these illnesses actually were subclinical infections with poliomyelitis virus.

As stated at the beginning of this paper, a suspicious case is taken as an illness in a household associate of a paralyzed or non-paralyzed case. The further stipulation is made that it must occur within three weeks of the onset of symptoms in the paralyzed or non-paralyzed case or within a similar period of another suspicious case in the household. The symptoms must be similar to the systemic symptoms experienced in paralytic cases of poliomyelitis. An illness with symptoms suggesting no possibility or probability of its being due to the poliomyelitis virus is not included, such as a fracture, one of the exanthemata, or any illness definitely diagnosed as something else, (or even a common cold, if consisting merely of the usual coryza and rhinorrhea).

TABLE III. SYMPTOMS IN SUSPICIOUS ILLNESSES

(Among the 878 household members of the 166 poliomyelitis cases.)

Symptom	Number	Per Cent
Headache	87	50
Fever	49	28
Diarrhea	43	25
Vomiting	42	24
General malaise	23	13
Dizziness	21	12
Abdominal cramps	17	10
Constipation	14	8
Sore throat	9	5
Drowsiness	6	3
"Fussed" (infants)	3	2
Recorded only as "flu"	2	1

There were 878 household members in the 157 families of the 166 paralyzed and non-paralyzed cases investigated. Among these 878 individuals there occurred 174 illnesses classified as suspicious cases (Table II). Some additional illnesses may have occurred subsequent to the epidemiologist's last visit, and, therefore, are not included in the tabulations. Furthermore, a few cases were reported and investigated so long after onset that it is likely some of the illnesses occurring in other members of the household were not recalled. These errors of omission would apply more to the suspicious illnesses, of course, than to the paralyzed and non-paralyzed cases, so it is well to keep in mind that the number of suspicious cases is a minimum figure.

TABLE IV. AGE DISTRIBUTION OF SUSPICIOUS CASES AND DEFINITE (PARALYZED AND NON-PARALYZED) CASES

(Among members of households in which paralyzed and non-paralyzed cases of poliomyelitis occurred.)

Age Group	Definite Cases		Suspicious Cases	
	Number	Per Cent	Number	Per Cent
0– 4	38	23	32	18
5– 9	42	25	58	33
10–14	41	25	39	22
15–24	39	23	24	14
25–49	6	4	21	12
50 and over	0	0	0	0
All ages	166	100	174	100

A list of symptoms was not checked in investigating these suspicious illnesses, but a routine inquiry as to symptoms by systems was pursued. A glance at the symptoms given may serve to indicate the nature of these illnesses. They are presented in Table III.

It is noteworthy that no one symptom exceeded 50 per cent, which further shows the difficulty of diagnosis upon a purely clinical basis. Taking the first four symptoms, however, headache, fever, diarrhea, and vomiting, 82 per cent had one or more of these symptoms. As to headache, which is a frequent complaint at any time, and due to a great variety of causes, it should be stated that in no instance was this the only symptom, but was always in combination with one or more of the symptoms listed above. A headache alone was not counted as an illness.

TABLE V. AGE AND SEX SPECIFIC ATTACK RATES FOR DEFINITE (PARALYZED AND NON-PARALYZED CASES COMBINED) AND SUSPICIOUS CASES

(Among members of households in which paralyzed and non-paralyzed cases of poliomyelitis occurred.)

Age Group	Attack Rates (Per Cent)			
	Definite		Suspicious	
	Male	Female	Male	Female
0– 4	36	26	23	24
5– 9	32	25	34	45
10–14	33	26	27	29
15–24	29	16	10	19
25–49	2	3	7	10
50 and over	0	0	0	0
All ages	22	16	18	22

Before proceeding further let it be specifically stated that it is neither claimed nor believed that every case considered here a suspicious case was due to an infection with poliomyelitis virus. Due to the lack of sufficiently characteristic symptoms to distinguish these illnesses from upsets which may result from various etiologies, and which are present in any large group of individuals at any one time, it seems likely that at least a few illnesses due to other causes have been included in this group.

The age distribution in the definite cases as compared with the suspicious cases is presented in Table IV. From this table it is evident there is a rough similarity in the age distribution in the two types of illnesses.

Age specific attack rates according to sex for definite cases and suspicious cases are given in Table V. From this table it will be noted that among the definite cases the attack rate was higher among males than among females for every group, with the exception of the twenty-five to forty-nine age group (only six cases in this entire group), which is in agreement with the well-known preponderance of males among recognized cases of poliomyelitis. When the suspicious cases are considered, however, the reverse is true, and females are found to have suffered

(Continued on Page 950)

CRANIOCEREBRAL INJURIES*

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THE adequate treatment of craniocerebral injuries is still a serious problem. The majority of patients with such injuries will recover without any treatment or regardless of the treatment, and a fairly large group will die in spite of any aid that can be given them. There is a small group of these patients, however, whose survival is dependent entirely on the type of treatment instituted.

It is the purpose of this paper to discuss the indications which demand proper treatment if the patient is to recover and to briefly outline the type of treatment which has proven satisfactory at the Ancker Hospital in Saint Paul.

The following pathological states can occur in head injuries and must be differentiated, as far as possible, in each case:

1. Concussion.
2. Contusion } With or without intracerebral
3. Laceration } hemorrhage or diffuse subarachnoid hemorrhage
4. Edema, or increase in cerebrospinal fluid.

   The actual fluid changes which take place in this fourth group are not clear, but whether they be actual intracellular edema, perivascular increase in fluid or increase in fluid in the subarachnoid space, they will be referred to simply as edema.
5. Hemorrhage, extradural or subdural.

The question of fracture of the skull is of secondary importance, unless, of course, there is a depressed fracture, in which case the fracture must command our most careful attention, but only in so far as it may cause brain damage or rupture of the vessels.

Concussion, contusion and laceration of the brain cause physiological and pathological lesions, which at the present time are not amenable to treatment. On the other hand, edema and hemorrhage are states which can be treated, due to the fact that they both cause increased intracranial pressure. It is therefore evident that increased intracranial pressure is the only state which is amenable to our present-day methods of treatment. If the increased intracranial pressure is due to edema or increased fluid, medical management is necessary. If the increased intracranial pressure is due to an extradural or subdural hemorrhage, surgical treatment is indicated. It is thus evident that the recognition of two conditions is all-important in the treatment of craniocerebral injury: (1) whether there is increased intracranial pressure present, and (2) if there is increased intracranial pressure, is this due to edema or is it due to hemorrhage?

1. The Determination of the Presence or Absence of Increased Intracranial Pressure

Increased intracranial pressure may be recognized in five ways:

(a) By observation of the state of consciousness of the patient.
(b) By observation of the blood pressure, pulse and temperature.
(c) By the subjective symptoms of the patient.
(d) By spinal puncture.
(e) By examination of the ocular fundi.

(a) Observation of the State of Consciousness of the Patient

Unconsciousness is not necessarily a sign of increased intracranial pressure. A patient without any increased intracranial pressure may be unconscious due to severe trauma to the brain. However, in a patient who is first conscious after a head injury and then becomes unconscious or in a patient whose state of unconsciousness becomes deeper, it is very probable that the intracranial pressure is increasing. The recognition of deepening coma requires frequent observations, as often as every two or three hours. Painful stimuli will aid in determining the depth of unconsciousness and the rate of progression. The most satisfactory method of producing such stimulus is by supraorbital pressure or by pressure over the styloid processes in front of the mastoid processes on each side. The patient will resist such pressure, if not too deeply comatose, and by observing muscular contraction during resistance, valuable information can be obtained concerning weakness or paralysis of the muscles of the face and extremities.

*From the Department of Surgery, University of Minnesota Medical School. Read at the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 27, 1941.

The state of consciousness in determining increased intracranial pressure, is only an aid, and it is necessary to have other evidence before making such a diagnosis.

(b) Observation of the Blood Pressure, Pulse and Temperature

Cushing demonstrated that a rapidly increasing intracranial pressure will cause a rise in blood pressure, a slow pulse and a rise in temperature. This is an extremely important observation in those cases which have an extradural hemorrhage, but unless frequent observations are made, every half hour to one hour, this change may not be observed. These frequent recordings of blood pressure, pulse rate and temperature are particularly important in the first twenty-four hours, as it is during this period that an extradural hemorrhage develops, as a rule.

The fact that there is no increase in blood pressure nor decrease in pulse is not proof that there is not a hemorrhage, as shock or hemorrhage elsewhere may mask these signs, but on the other hand, if these signs are present they strongly suggest a rapid rise in intracranial pressure which is usually caused by hemorrhage.

A slow increase in intracranial pressure does not, as a rule, affect the blood pressure and pulse rate to a very significant degree. A slow increase in intracranial pressure is usually caused by edema, chronic subdural hematoma or other expanding lesions of the brain.

(c) The Subjective Symptoms of the Patient

Headache, nausea, vomiting and lethargy are subjective symptoms which, in the presence of a head injury, strongly suggests the presence of an increasing intracranial pressure.

If, after an evaluation of the state of consciousness of the patient, the blood pressure and pulse rate, and of the subjective symptoms of the patient, there is doubt, and there frequently will be, as to the state of intracranial pressure, a fourth diagnostic measure is available for its determination, namely, spinal puncture.

(d) Spinal Puncture

A spinal puncture is at first a diagnostic, rather than a therapeutic, procedure, and it is our custom to use it in the first twelve to twenty-four hours only if, after observation of the state of consciousness of the patient, the blood pressure and pulse leaves one in doubt as to the amount of intracranial pressure. In the succeeding days spinal puncture becomes increasingly important, not only as a diagnostic measure, but also as a method of treatment. This is particularly true in those patients whose state of consciousness does not change and whose blood pressure and temperature remain stationary. In these instances, repeated spinal puncture is invaluable for the measurement of the intracranial pressure and is of value in the treatment of increased pressure due to edema. So far as we know, a spinal fluid pressure reading is the most accurate and simple method of determining the amount of intracranial pressure, unless, of course, there is a block to the flow of spinal fluid in the aqueduct or fourth ventricle, in which case the spinal fluid pressure would be erroneously low.

If it is admitted that spinal puncture is easily performed and that it accurately measures intracranial pressure, we might ask why one should ever hesitate to perform spinal puncture. The controversy concerning the diagnostic and/or therapeutic value of spinal puncture is well known. It is our opinion that early spinal puncture (within the first twelve hours) with rare exceptions will give no information that cannot be obtained by careful observation of the state of consciousness, blood pressure, temperature and pulse, and that it unnecessarily disturbs the patient.

(e) Examination of the Ocular Fundi

There is a fifth maneuver by which intracranial pressure may be diagnosed, that is, by the examination of the fundi. This is a more specialized procedure and is of particular importance a week or ten days after injury, when it is a useful measure in diagnosing subdural hematoma. Persistent drowsiness and headache should suggest a fundus examination for papilledema.

The recognition of increased intracranial pressure is most important, because it is the crux of the successful treatment of head injuries. If there is no increase in intracranial pressure, the symptoms are due to concussion, contusion or laceration of the brain and no specific treatment is of value. If there is an increased intracranial pressure, edema or hemorrhage is present and it remains only to differentiate that small group of cases which have extradural or subdural hemorrhages from the large group which has edema.

2. The Differentiation of Extradural or Subdural Hemorrhage from Edema as a Cause of Increased Intracranial Pressure

This differentiation is often difficult and an adequate discussion cannot be given here, but, in general, localizing signs, such as progressive paresis, or paralysis of muscle groups, dilated pupil, et cetera, in the presence of increased intracranial pressure suggest the presence of a hemorrhage.

Emergency Treatment.—Needless to say, patients who have suffered head injuries frequently have sustained concomitant injuries which are more serious in their immediate effect than the head injury. If a head injury is severe enough to cause death within the first few hours following the injury, it is safe to say that no form of treatment which might have been instituted would have been successful. Therefore, valuable time is never wasted in ascertaining the general bodily condition and in giving adequate emergency treatment for shock, fractures, et cetera. Patients suffering head injuries only, suffer to a surprisingly small degree from shock. Consequently transportation of these patients to hospitals with adequate facilities for their care is possible.

Emergency treatment consists for the most part of care of lacerations and ascertaining the presence or absence of depressed fractures. If a depressed fracture is present, adequate cleaning with a copious saline wash, control of hemorrhage and transportation to a hospital where adequate decompression can be carried out is indicated.

Active Treatment.—As stated above, a correct diagnosis is the most important factor in the treatment of craniocerebral injury. Because observation plays a major rôle in the diagnosis, a definite routine for all head injuries is indicated. This routine consists of:

(a) Half-hourly to hourly recordings of the blood pressure, pulse and temperature, depending on the severity of the injury. If little change appears in the first twenty-four hours, the interval of recordings can be increased to three or four hours.

(b) A record of the state of consciousness of the patient at frequent intervals.

(c) A thorough neurological examination at frequent intervals, depending on the severity of the injury.

(d) The head of the bed should be elevated slightly if there is no shock, and there should be no constricting bandages around the neck. If cerebrospinal fluid is flowing from either the ears or the nose, efforts to promote free drainage should be made, such as turning the head so that the draining ear is dependent. Spinal puncture, in the presence of the escape of cerebrospinal fluid from the ear or nares, is, as a rule, not necessary and is contraindicated.

(e) *Spinal Puncture.*—As has been indicated, spinal puncture is primarily a diagnostic procedure when there is doubt as to the state of the intracranial pressure. It is our practice to do diagnostic spinal punctures on all cases after twelve to twenty-four hours, if the injury is severe or if there is no improvement, unless, of course, there is definite evidence of an extradural hemorrhage, in which case spinal puncture is contraindicated because it may increase the hemorrhage.

If on spinal puncture there is an elevation of pressure above the normal of 120 to 160 mm. of water, enough spinal fluid is removed to bring the pressure to normal, or in cases of exceedingly high pressure, to half its original level.

In cases in which the spinal fluid pressure is elevated, spinal fluid is removed at six-hour or twelve-hour intervals. The other medical measures for the reduction of increased intracranial pressure as given below are instituted.

The greatest significance of blood in the spinal fluid is that it is evidence of severe enough damage to cause rupture of blood vessels into the subarachnoid space. The prognosis in such cases is graver than in those having a clear spinal fluid. It has been experimentally shown that spinal puncture does not appreciably decrease the amount of blood in the subarachnoid space.

(f) *Dehydration.*—Intracranial pressure can be reduced by dehydration. Fluids are restricted for twenty-four hours to 1000 c.c. There is a danger that dehydration may be carried too far. It is difficult to determine the fluid requirements of an unconscious patient, because such a patient is frequently incontinent, and good judgment is necessary in administering fluid. As a general rule, a patient should never be given less than 1000 c.c. in twenty-four hours, and if the period of unconsciousness is prolonged for four or five days, it is wise to give 2000-3000 c.c. of fluid daily.

Hypertonic solutions of 50 per cent sucrose should be given if it has been decided that increased pressure is due to edema. Our practice has been to do a spinal puncture and reduce the pressure by the removal of fluid. This is followed in three to six hours by 50 c.c. of 50 per cent sucrose or 25-50 c.c. of sorbitol. A spinal puncture is done at the end of six hours, and, if the pressure is still elevated, another injection of hypertonic sucrose is given. This is followed in six hours by another spinal puncture, and the procedure is repeated until improvement has taken place. During these procedures, the presence of an extradural or subdural hemorrhage must always be kept in mind, as repeated spinal punctures will increase the hemorrhage.

From the foregoing, the necessity of using a spinal manometer is self-evident. Judging the pressure by the force with which it is expelled from the needle is exceedingly erroneous.

(g) *Sedation.*—The sedation of patients with craniocerebral injuries is a problem, as adequate sedation may mask important diagnostic signs. The opiates are considered to be contraindicated because of their depressant effect on respiration, and because of their constricting effect on the pupils. However, in severely injured patients who are conscious it may be necessary to administer opiates for the relief of shock-producing pain. This is justifiable, but in considering a diagnosis the amount of opiates previously given must always be taken into consideration.

Sodium luminal intramuscularly, pentothal sodium intravenously or chloral hydrate by rectum may be given as needed for the control of restlessness. It goes without saying that the amount given must be taken into consideration in evaluating the state of consciousness of the patient.

(h) X-rays need not be taken as an emergency procedure, unless a depressed fracture is suspected. Basal skull fractures can be diagnosed from the signs of ecchymoses around the eyes, blood behind the tympanic membrane or bleeding from the ear, or cerebrospinal fluid flowing from the ears or nose.

Occasionally when there is doubt as to the location of an extradural hemorrhage, a lateral x-ray film may show a fracture through the temporal or parietal bone, in which case the hemorrhage is more frequently found in the region of the fracture.

Every patient suffering from head injury should have an x-ray before discharge.

(i) The surgical treatment of head injuries consists in the suture of lacerations of the scalp, elevation of depressed fractures, and the liberation of extradural and subdural hemorrhages. A discussion of these technical procedures is not a purpose of this paper.

Conclusion

The successful treatment of head injuries depends to a great extent upon the recognition of the presence or absence of increased intracranial pressure. Those pathological entities which occur, but do not of themselves cause increased intracranial pressure, are not amenable to present-day methods of treatment.

If increased intracranial pressure is present, it remains to determine whether this state is caused by edema or by extradural or subdural hemorrhage, following which, appropriate measures can be taken to aid the patient's recovery.

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TREATMENT OF COMMON EYE INJURIES*

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EYE injuries are the most disabling of all nonfatal industrial accidents. Although the incidence of eye injuries in industry has been gradually decreasing due to education and safety measures, the number of eye accidents in rural and agricultural districts are increasing. Considering the fact that the United States has a blind population of 110,000 persons, 15 per cent the result of accident, the treatment of common eye injuries seems to be a subject worthy of consideration.

Conservation

The first thought in the treatment of all types of eye injuries should be conservation. Some vision can be saved for many eyes that at first examination appear quite hopeless. The sooner these cases are in the hands of a competent oculist, the better. In passing, I wish to say that the old teaching that a perforating wound of the eyeball, especially through the corneo-scleral area (danger zone) indicated removal of the eyeball at once as a safeguard against sympathetic ophthalmia, and that eyes with intraocular foreign bodies which cannot be removed for various reasons, should also be enucleated for the same reason, has now been proved false, for we have found that under proper management, it is perfectly safe to conserve the eye. As a matter of fact, in over thirty-five years of practice, I have never seen a case of sympathetic ophthalmia, and this is the experience of most oculists. This fallacious teaching, like so many others in medicine, has been copied from one book to another, without foundation in fact.

Histology and Physiology

Intelligent first treatment of wounds of the eye is probably more important than that of wounds in any other part of the body. As many cases are, of necessity, first seen by the general practitioner, it is very necessary that he be able to render intelligent service, and that he also have a realization of possible later complications of even the most minor eye injury. In treating eye injuries, we must keep in mind two things: (1) to preserve as good-looking an eye as possible; and (2) to restore, or maintain, as much function as possible. With these objectives in mind, I am going to refresh your knowledge of the histology and physiology of the cornea, the most important part of the eye, and the part which is most frequently injured.

The epithelial covering of the cornea possesses a remarkable resistance to infection, in spite of the fact that it does not receive the blood supply directly, as do other organs, but indirectly by dialysis from the conjunctival blood vessels at the limbus. This corneal epithelium provides an amazing safeguard against both trauma and infection by virtue of its rich sensory nerve supply and by reason of the imperviousness of the superficial epithelial cells. Immediately beneath the epithelial layer is Bowman's membrane, which is quite impervious to infection when unbroken. Next is the substantiæ propria cornea, which is made up of lamellæ of transparent collagenous fibrillæ, between which are fixed cells, or corpuscles and wandering leukocytes. This is much less resistant to infection than the two overlying layers. Then comes another very resistant glass-like membrane, Decemet's membrane, then a layer of endothelial cells.

It is essential to keep these facts in mind in every case of eye injury, as it is necessary for proper treatment and for proper visualization of the healing of wounds in the anterior segment of the eye. When a wound in the cornea becomes infected, the superficial corneal lamellæ become necrotic because wandering corneal leukocytes have invaded them to stamp out the infection. No blood being in the cornea, the leukocytes must travel through the interlamellar lymph spaces to the limbus, the nearest blood supply, and back to the site of the infection. Because of the long distance between the two locations, healing is slow and infection is not easily overcome.

Prevention of Eye Injuries

Prevention of eye injuries depends on three things: legislation, education, and organized accident prevention. The work done by the American Red Cross in its campaign of education to prevent ordinary household accidents is to be com-

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mended, for 95 per cent of the typical home eye accidents could be prevented. There must be laws enacted to safeguard the youth of this country if we are going to remove from our records a large number of lost eyes each year. I am referring to the sale of fireworks, and Minnesota is to be complimented on the laws passed at their last legislature banning the sale of fireworks. It is the tenth state to pass such a law.

The education program in industry has made marvelous strides and the number of eyes lost in large industrial centers is less than in rural agricultural states, because in the latter many auto owners and farmers do their own repair work on machinery and automobiles without having had previous training for the work and without realizing the great danger not only to themselves but to those who work with them. We have no statistics on injuries of this kind but from the number of eye injuries we see outside of industry, I am quite sure the incidence of eye injuries is relatively much higher than in industry where the incidence is 9 for every 1,000 employes.

The use of goggles and glasses stands first among preventive measures, quite contrary to the popular idea that the wearing of glasses is a great hazard from the danger of the lenses being broken. This idea is likewise supported by experience, for I have seen only one case of injury to the eyeball by a broken lens.

History

When you first see an eye injury case it is very important to take a complete history as to the nature of the injury, when and how sustained, what treatment has been given, and to test the vision of the injured eye as well as of the uninjured eye, and a careful minute description of the appearance of the injured eye.

Before making the examination it is well to cleanse the eye and adnexia with a mild antiseptic, such as boric acid solution. An anesthetic should then be used, and the choice of anesthetics is a solution of either butyn two per cent or pontocaine (.5 per cent). Cocaine solution should not be used as it softens the superficial corneal epithelium which decreases its resistance to infection, and it also dilates the pupil, which in some cases is a decided disadvantage. Fluorescein solution should be used in all cases to determine the extent of the injury of the cornea as it reveals slight corneal abrasions which are so difficult to detect otherwise.

To make this examination it is essential that you have good light. Oblique illumination by means of a condensing lens is the most simple and satisfactory. First examine with the naked eye, and it is good practice to get into the habit of making your routine examination by means of a magnifying loupe. Much valuable information can be obtained by use of the slit-lamp.

Frequently a patient comes in complaining of a foreign body in the eye, when there is none, but there may be a slight abrasion of the corneal epithelium. Again, a patient may complain of being injured by a foreign body while pounding on a piece of metal, and on casual examination no foreign body can be found. In these cases, it is well to give the eye a thorough examination, as a minute particle may have perforated the cornea and lodged in the interior of the eye, in the lens or vitreous, giving the patient no sense of discomfort. When an intraocular foreign body is suspected, an x-ray study should be made.

Treatment should consist of systemic, as well as local treatment. In treating the so-called minor injuries we must not regard them too lightly. I believe that every patient who comes into our hands should be carefully examined before anything is done. We must always remember that most corneal ulcers, frequently having disastrous results, develop from a trivial or minor injury.

By far the most common form of trauma to the eyeball is caused by the entrance of a small particle which lodges somewhere in the conjunctiva or the cornea. The danger in these cases lies in infection, either from organisms already in the conjunctival sac, on the foreign body, or from organisms carried into the eye in attempting to remove it. If the foreign body is on the conjunctiva, it can be removed easily by means of a moistened cotton swab. If the foreign body is embedded in the epithelium, it is best removed with a sharp instrument, care being taken that after removal of the foreign body all infected tissue at the site is also removed as well as the surrounding corneal tissue which has been traumatized by the foreign body. A small dental burr is often a great help in this procedure. If the foreign body can be removed without injuring Bowman's membrane, infection rarely takes place, and the break in the epithelium heals in a very short time. If the foreign body has pene-

trated Bowman's membrane, and is removed early with aseptic precautions, healing will usually take place so rapidly that infection is shut out.

When Bowman's membrane is penetrated, and the case is seen for the first time twenty-four hours or more after the injury, there is often a narrow zone of grey infiltrate about the foreign body. Here the superficial corneal lamellæ are necrotic, and wandering corneal leukocytes have invaded them to stamp out the infection which is there. When the wound is not infected, healing may take place rapidly, but if it is infected, the invading organisms may increase; then their toxins must flow through the interlamellar lymph spaces to the limbus before reaching any blood supply. Then serum and leukocytes must travel back to the site of the injury to be effective against the organisms.

First aid in all kinds of perforating wounds, whether there is an intraocular foreign body or not, is a well-applied fixation bandage, because with perforating wounds we have the danger of expulsion of the intraocular structures such as prolapse of iris and ciliary body and lens, and danger of intraocular hemorrhage. We also have the possibility of infection, as there is an open pathway by which infection may reach the interior of the eye.

If the cornea is cut and there is injury to the lens and prolapse of iris and other contents, the eye is cleansed and well anesthetized. Then the prolapsed iris should be removed and if the lens has been injured, the lens material should be removed by suction and irrigation so that the lips of the wound in the cornea and sclera are clean. One or more stitches in the cornea are often necessary, after which a large conjunctival flap should be drawn over the entire wound, atropine instilled, and the eye securely bandaged.

In all cases when the corneal epithelium has been broken, an antiseptic ointment should be used, and the eye covered with an eye pad. The treatment should be repeated daily and under no circumstances should the patient be dismissed until the epithelium is smooth and does not retain a stain. It is often advisable to dilate the pupil with a 2 per cent solution of homatropine.

Perforating wounds with retention of the foreign body must be carefully studied, as we realize that only the aseptic and chemically indifferent foreign body can be retained in the globe without causing irritation and inflammation. Frequently chemical substances such as iron, copper, glass, and stone may cause but slight exudation and become encapsulated. The location of the foreign body is very important, as the choroid and ciliary body become most easily irritated, the vitreous and retina next, with the lenses the most tolerant. The size and shape of the intraocular foreign body have much to do with the tolerance, small rounded intruders being tolerated much better than large, sharp, or pointed objects.

A thorough x-ray study should be made, and the size, shape and location determined. Then, if the foreign body is magnetic, an attempt should be made to remove it with the magnet. I have found the Lancaster hand magnet very satisfactory, as it is much more easily handled than the giant magnet. Two methods are used: 1. An attempt may be made to remove the steel through the original wound in the anterior segment of the eye, or, if not through the wound, to draw it into the anterior chamber and then make a small incision at the corneo-scleral juncture through which the foreign body is removed by means of the small hand magnet. 2. If the lens has *not* been injured, and the foreign body is located in the vitreous or posterior segment, it is best to remove it by raising a conjunctival flap directly over the location of the foreign body, making an opening through the sclera through which the foreign body can be removed with the hand magnet.

In all cases of perforating wounds of the eye antitetanic serum should be given, and I have found the use of foreign proteins of immeasurable value. We use them as routine treatment. Atropine ointment should be used and a good fixation bandage applied. The patient should be given absolute rest.

Chemical burns are frequently most disastrous to the sight. Burns with alkalies, such as amonia and soda or potash are often very deceptive, as they generally appear at first less serious than they really are. The injured cornea retains its transparency for some time after the tissues have actually been killed to a considerable depth. Burns with sulphuric acid (battery fluid) are especially dangerous as one drop of sulphuric or nitric acid will often destroy the eye.

The best treatment is to put the patient on his back and flush as quickly as possible with plenty of luke-warm water between the well-opened eye-

lids. Do not waste valuable time securing substances to produce chemical neutralization. After this treatment, use a mild antiseptic ointment and fixation bandage.

Contusions

Injuries from large and blunt objects produce contusions and ruptures with dislocation of ocular structures. The most common are the tearing of the iris from its insertion, producing iridodialysis, rupture of the iris sphincter, and dislocation of the lens. Any of these lead to serious complications such as hemorrhage into the anterior chamber and occasionally blood extravasation within the corneal lamellæ. A dislocated lens is always serious, as it sets up an inflammation and often causes acute glaucoma. Contusion of the eyeball is often followed some weeks later by secondary changes, especially in the lens.

Summary

1. Following injuries to the eye a careful history should be taken.

2. Examination should be made with oblique illumination.

3. The injury should be described minutely.

4. A record should be made of the vision of uninjured as well as injured eye.

5. Even in minor injuries every aseptic precaution should be taken.

6. The eye should be covered with a patch in all cases of corneal injury.

7. First aid in the case of perforating wounds consists of atropine, a fixation bandage, and complete rest.

8. Do not advise enucleation of seriously injured eyes, as many, which on first examination appear hopeless, can be saved.

9. In case of burns from chemicals flush freely with luke-warm water as soon as possible.

INJURIES TO SOFT TISSUES OF THE NECK*

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THE NECK, because of its exposed and vulnerable position, is particularly susceptible to trauma of many types. The large number of important structures which transverse it and their almost total lack of protective covering make any injuries to soft tissues in this region a potentially dangerous one. For the same reasons the therapeutic problem involved in the treatment of such injuries may at times become quite complex.

Any consideration of the detailed anatomy of the neck is beyond the scope of this paper and for such information the reader is referred to the standard texts on the subject. Among the structures most commonly injured are the muscles, superficial and deep veins, nerves, thyroid gland, thoracic duct, larynx, trachea and esophagus, any or all of which may be involved in a single injury.

Types of Trauma

Trauma may be of either the blunt or sharp variety and may occur from without or within. Blunt trauma by a blow from a soft or hard object, by constriction by rope or by hand as in choking or from a severe twist produces bruising of the tissues, tearing of various structures and possibly fracture of cartilage of the larynx or trachea. This is followed by swelling, edema, extravasation of blood or possibly a hematoma which may assume serious proportions. The bleeding may continue, the blood dissecting along the fascial planes, at times in amounts sufficient to produce vascular or respiratory obstruction. Conservative treatment with immobilization and cold applications are usually sufficient although surgical intervention may be necessary to control continued bleeding, or tracheotomy to relieve respiratory obstruction from edema or extraneous pressure.

Sharp Trauma.—Incised wounds of the neck structures are usually produced by knife or razor cuts, self-inflicted or otherwise, glass cuts from automobile windshield or window glass, stab wounds from knife or glass, wood or other splinters, and by bullets, or other missles, large or small. They may cause damage to several

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structures and may be extremely serious. Hemorrhage may be severe, vital structures may be laid bare or damaged and tissue spaces exposed to serious infection. Emergency treatment consists of control of hemorrhage by clamping, ligation or packing and the protection of the wound from additional soiling. Later, thorough cleansing with removal of all foreign material, a débridement of all devitalized tissue and accurate control of all bleeding points is followed by primary suture with or without the inclusion of a powdered sulfonamide compound. If the trachea, esophagus or thoracic duct has been injured the defect is repaired and packing or drainage left in the wound or anterior mediastinum instead of making primary closure. Such steps are advisable because of the dangers of infection and the facility with which it spreads along the fascial planes and through loose areolar tissue to the anterior mediastinum.

Muscles.—The muscles most usually injured are the platysma, sternocleidomastoid and prethyroid groups, though occasionally the scalene, omohyoid and constrictors of the pharynx and others may be involved. Primary suture should be carried out with special attention being paid to accurate approximation of the platysma if one is to avoid retraction and wide scar formation.

Vessels.—The superficial veins, because of their exposed position, are unusually susceptible to injury. Some of these veins if widely opened, particularly in a dyspneic patient, may suck air and permit air embolism. Pressure or packing below will control this tendency until clamping or ligation can be done. Injury to the internal jugular or subclavian veins or the carotid or subclavian arteries or their branches are of much more serious import and may result in blood loss of exsanguinating proportions. Prompt control by pressure followed by clamping or ligation offers the only hope. Primary suture of vessels while theoretically advisable is rarely feasible unless the injury occurs during an operative procedure.

Thoracic Duct.—Only occasionally is a thoracic or right lymph duct injured. If the duct is opened rather than completely severed, suture may be attempted although packing will usually suffice. If section is complete and conditions are favorable suture repair may be attempted, but ligation will frequently be necessary.

Nerves.—The superficial branches of the cervical plexus are most prone to injury but the resultant damage is slight. The brachial plexus though situated more deeply in the neck is not immune to serious injury. Injury, however, may result from a direct blow, a deep cut or stab, or a tearing from a strong jerk or traction on the arm. Direct repair may at times be possible if recognized but is usually difficult and frequently impossible. The vagus, sympathetic trunk, phrenic, or recurrent laryngeal nerves may also at times be injured or interrupted.

Thyroid.—The thyroid gland is relatively exposed so that its substance as well as its blood supply may be cut or injured. Ligation of vessels, suture of incised portions or even excision of injured areas of the gland may be necessary.

Pleura and Lungs.—Unless reminded of it from time to time one is likely to forget that the cupola of the pleura and apex of the lung extend into the neck and must be considered among the cervical structures. Perforation of the pleura or the lung underneath may occur in any deep cut or stab wound of the neck and from bullet wounds, perforation by splinters from a fractured clavicle or during surgical operations in the cervical region. The resultant sudden pneumothorax may throw the patient into collapse. If the pleural opening is small a tension pneumothorax may result which unless recognized and promptly relieved may prove very serious for the patient. Leakage of air from the lung or pleural cavity into the areolar tissue of the neck may give rise to extensive subcutaneous emphysema leading one to suspect possible tracheal injury. Closure of the pleural defect is usually impossible but air-tight closure of a neck wound followed by aspiration of the pleural air will suffice unless there is leakage of air from the lung itself which will require constant negative pressure, catheter drainage of the pleura, but very rarely thoracotomy for suture of the injured lung.

Pharynx, Larynx and Trachea.—Direct Blunt trauma to larynx and trachea may result in bruising, swelling and edema, while greater force may fracture the hyoid bone or laryngeal or tracheal cartilage, a more serious or even fatal complica-

tion. Cough, hemoptysis, dyspnea, hoarseness and even emphysema frequently follow such injury. Rest, cold applications, steam and oxygen inhalations will frequently afford relief, but tracheotomy may become necessary to relieve obstruction and save life.

Sharp trauma, usually from a razor or glass cut may open the pharynx, larynx or trachea. Such cuts often gape wide enough to permit free escape of air and prevent extensive emphysema, but may permit the aspiration of blood and secretions which may later produce pulmonary complications unless aspirated from the bronchial tree. Deep stab or bullet wounds of the trachea may be followed by extensive emphysema of the neck, head, chest or even the whole body. If unrelieved, pain, dyspnea or even suffocation may follow. Wide exploration of the damaged area with primary suture of the tracheal wound must be carried out promptly. If the defect is too large or irregular for accurate closure, a patch of fascia lata may be used to reinforce the opening. Because of contamination of the wound by tracheal secretions, loose packing should be left in the field to help localize infection and free drainage should be instituted. The local implantation of one of the sulphonamide compounds into the wound may be of some value and does no harm.

Esophagus.—The deep position of the esophagus behind the trachea protects it from most agents which injure the other structures of the neck. Occasionally a deep stab or bullet wound penetrates the esophagus and causes leakage. Rarely a stick or other object carried in the mouth is rammed down the throat and forced through the pharyngeal or esophageal wall. More commonly some foreign body such as a bone, nail, pin or other sharp object becomes impacted in the esophagus, perforating its wall spontaneously or as a result of the injudicious passage of a stomach tube or bougie in an attempt to dislodge it. Similarly the passage of an esophagoscope may force such a foreign body through an area already weakened by infection or of itself may cause perforation.

Esophageal perforation from whatever cause is potentially at least a very serious matter. Escape of air from the site of injury into the loose areolar tissue of the neck causes a rapidly spreading emphysema which carries mouth and esophageal secretions and food particles teeming with virulent aerobic and anaerobic bacteria through the tissue spaces. Here, rapidly developing swelling, tenderness, fever and leukocytosis are indications of the rapidly spreading infection which follows such contamination. Direct extension of infection from the local field to the superior mediastinum occurs readily and constitutes a serious threat to life. Once considered a fatal complication it is now recognized that prompt surgical intervention with removal of foreign material, closure of the esophageal opening by suture if accessible, and the establishment of free and adequate drainage of the upper mediastinum with or without chemo-therapy will save a majority of these patients.

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PENETRATING WOUNDS OF THE ABDOMEN*

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PENETRATING wounds of the abdomen may be divided into three groups: stab wounds, gunshot wounds, and wounds by other miscellaneous objects. Statistics concerning these wounds have been so thoroughly discussed in the literature that no mention of them will be included here. But, in all other phases of the topic, outstanding opinions of various authors will be concisely presented.

Stab wounds of the abdomen have a mortality of about half that of gunshot wounds. These wounds are usually clean, sharp-edged, well defined incisions with little or no damage to adjacent or distant tissues. Unless there is severe hemorrhage, shock is slight. Infection is least liable in this group. Bacteria carried in are usually of a type to which the patient has some immunity. Fragments of clothing and other foreign matter also may be embedded in the wound. All stab wounds which possibly have penetrated the

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abdominal cavity should be explored by an incision extending to the peritoneum and search made for openings into the cavity. If the peritoneum is penetrated, the abdomen should be opened and a search made for injuries to any organs. If no perforation is found, one should débride, cleanse with normal saline, insert a superficial drain, and close.

Dangers are hemorrhage, penetration of a hollow or solid viscus, and shock, in that order. Large knives may cut big holes in the intestines or blood vessels and cause massive hemorrhage or infection. The liver is frequently injured in deep stab wounds; the spleen and kidneys rarely.

Gunshot wounds have varying effects depending on the size, character, and speed of the missile. Wounds by high-speed rifle bullets, especially if metal jacketed, usually have a straight course from entrance to exit. These bullets usually perforate everything in their course. If the bullet is small, the danger from hemorrhage is less but always present. Perforations too are important and may be one or many, involving any organ. Shock is always present in bullet wounds, but the smaller the bullet the less the immediate shock. The adjacent tissues are usually damaged by indirect force. Even distant organs may be indirectly injured. The amount of injury varies from minor contusions to explosive-like action which may completely destroy the spleen, a lobe of the liver, a kidney, or other organ. Even hemorrhage into the mesentery and retroperitoneal spaces without perforation is not uncommon. The pancreas is least often affected, but, when injured, is most dangerous.

Larger bullets, especially if not jacketed, cause more damage to the adjacent tissues. By direct force, wide areas around the track are badly contused. Indirect injuries to distant tissues are common and often severe. These bullets are more liable to deflection, and the slower the speed the greater the changes in their course. Rotation due to rifling may also change the course of the projectile. In this group of wounds, the dangers are (1) shock; (2) massive injury to adjacent and distant tissues; and (3) hemorrhage. Infection is more frequent than in wounds caused by small, rapidly moving bullets, even when the intestines are not perforated. Foreign matter is more liable to be implanted in the tissues.

Shotgun wounds inflicted at close range may be considered about the same as those of large, slow bullets, but the damage to adjacent tissues and hemorrhage is usually greater. Shock is much greater. Large holes are frequently torn and fairly often whole organs are destroyed. The area of damage can be anatomically fairly well outlined except for the secondary effects. Wounds made from greater distances are a different problem. In these, many entrance wounds may be made and many organs, both solid and hollow, perforated. However, the small wound often seals itself. Here it might be advisable to watch the patient and treat him expectantly, especially if the surgeon is a slow operator. One author has reported seven shotgun wounds, all of which had probably perforated the intestines, treated conservatively with recovery.

Wounds by miscellaneous objects are so varied in cause and effect that the surgeon must evaluate each one separately. Here, surgical judgment is most important. Injuries caused by everything from ice picks, lathe shavings, stones, and flying steel fragments to 2 by 4 inch timbers have been reported.

Foreign bodies may perforate the intestinal tract from within. Swallowed pins and needles are the most common articles. Dr. Wyatt of Minneapolis recommends keeping the patient quiet, feeding a bland diet, and making a radiograph every twelve hours. If the pin or needle stays stationery for twenty-four to forty-eight hours, the abdomen should be opened and the object removed. Cotton and barium mixture are condemned, as their use may cause obstruction. Pins, razor blades, and other sharp objects introduced through the anus have been known to perforate the rectum. Here, wide incision must be made through the perineum, removing, if necessary, the coccyx or even part of the sacrum. The wound in the rectum should be repaired, leaving wide drainage for closure by granulation.

Symptoms and Physical Findings

In all penetrating abdominal wounds, the most common symptom is weakness. This varies with the degree of shock commonly present. A rapid pulse is frequently noted and when combined with falling blood pressure is a sign of massive hemorrhage. Low hemoglobin determinations come too late to be of diagnostic value. Pain is second in frequency, yet often there is little or none. Storck reports pain often absent in perfo-

rations of the large intestine. It is more often present in perforations of the stomach and small intestine. Pain depends more on damage to the soft parts and does not indicate the extent of the injury. Pain in the back points to abdominal hemorrhage. Nausea and vomiting are not frequent and, while blood in the vomitus is a sign of stomach injury, its absence is of no value. Air hunger and thirst are danger signs of hemorrhage.

The physical findings are of little more value. To wait for definite signs is often fatal. Abdominal tenderness is not always present, but when present suggests perforation, and, if combined with rigidity, means perforation of some viscus. Dullness in the flanks means blood in the peritoneal cavity. Gas indicates perforation, but its absence is of no value. Bennet of Chicago reports free air in an abdomen without perforation of the intestine or lung probably carried in with the knife. Rapid or irregular breathing is frequent and usually due to shock. Early abdominal distention is rare; later it is more frequent; but, like decreasing hemoglobin in prolonged hemorrhage, usually occurs too late to be of diagnostic value. Rigidity with back pain and rapid pulse usually means a massive hemorrhage and demands immediate exploration.

Treatment

Treatment must be started at once. Primary shock must be treated before any surgical procedure is attempted. The mortality rate is very high when operations are done before shock is controlled. External heat is the first need. Replacement of lost fluids by intravenous five per cent glucose in normal saline, plain normal saline, or five per cent glucose in sterile water should be started at once. As soon as matched blood is available, transfusions should be given by either the direct (preferred) or citrate method. In the presence of massive hemorrhages, transfusions are life savers. If matched blood is unavailable, isotonic solutions are best. Morphine, in sufficiently large doses to control pain, is given early with atropin added to the first dose as an aid for later anesthesia. Morphine also slows peristalsis and lessens the danger of spreading contamination. Stimulants are used when indicated. Coramine is the best respiratory stimulant and caffeine sodium benzoate, metrazol, and camphor are recommended. It is customary at the Brainerd Clinic to give shock cases 1 c.c. of cortate (adrenal cortex) and repeat once daily for three days. On the way to the operating room, x-rays may be taken to locate bullets or gas in the abdomen, and the plates may be read later.

When perforation is suspected, one must not wait for definite signs and symptoms, but should explore at once. One author advises taking the patient directly to the operating room, treating shock and making diagnostic procedures there, thus saving time and extra handling of the patient. Our patients suspected of perforation of the stomach are given 30 c.c. of 2 per cent solution of methylene blue. The time saved by this procedure in locating perforations greatly outweighs any danger of infection. If not previously given, 1 c.c. of prostigmin or pitressin is given to lessen postoperative distention. If there is no evisceration, the abdomen is shaved, using benzene for a lubricant, washed with ether and then painted with tincture of iodine. The iodine should be removed before or after operation. If evisceration has occurred, no shaving is done. The protruding bowels are irrigated thoroughly with normal saline; often two or three gallons are used. The abdomen is then scrubbed thoroughly with ether.

Anesthesia.—If shock is not pronounced and the systolic blood pressure is between 100 and 150, spinal anesthesia is the choice. In respiratory complications, spinal anesthesia should be used. For the patient in shock, with severe hemorrhage, a pathologic heart, or slow respirations, ether still is best. Cyclopropane, with which one can use a larger percentage of oxygen, ethylene, or ethylene and ether may be used where the anesthetist has a special ability with one type.

Operation.—Of first importance in gunshot wounds from high powered rifles, large pistols, and shotguns at close range is an incision large enough to explore all adjacent areas thoroughly and to examine quickly distant organs for gross indirect damage. In stab wounds, only the area traversed by the knife should be explored and the incision made accordingly. The incision may be made in or near the line of penetration. Right or left rectus incisions are most common as they give good exposure and save time.

When down to the peritoneum, Dr. Maxeiner of Minneapolis fills the wound with water and looks for gas bubbles. Finding none is of no

value, but, if found, a perforation in the gut or through the diaphragm into the lung is indicated. The peritoneum must be opened cautiously, causing no sudden change in intra-abdominal pressure lest a quiescent hemorrhage be started again or a slow hemorrhage be aggravated. Quickly evaluate the abdomen for the presence of blood, gross damage, perforations, extravasation of urine, odor of colon bacillus and free gas. First stop hemorrhage; when possible pick up bleeders and ligate. Liquid blood in the abdomen is best removed by a suction apparatus. Sponging may spread contamination or open punctures. Large clots should be carefully picked out. Retroperitoneal hemorrhage, unless there is active bleeding, should be let alone.

Large tears in the liver may be packed with gauze, the other viscera and wall protected by a rubber tissue tube. The gauze must be left four to seven days and then removed very cautiously, twisting to release and removing only a little at a time. Simple tears should be sutured. Turner presented an excellent method of preventing cutting by sutures. One deep stitch, using swaged needle sutures, is placed parallel with, and near, each edge, and tied loosely. Then the needed sutures are placed behind these and tied over them. Other surgeons use small strips of fat at the entrance and exit of perforations by the needle to prevent tearing. Indirect injury to the liver is often high and hard to reach. Here, the incision may be extended transversely near the costal margin. This incision also is used when a badly damaged spleen is found. Injury to the spleen is difficult to repair and, if extensive, the spleen should be removed. Transfixation of the pedicle is dangerous. Be careful not to damage the pancreas.

Perforations in the stomach and intestine should be carefully searched for and closed. Small perforations are best closed by a deep purse-string reinforced by interrupted sutures. With larger wounds, the Lambert or Cushing suture is used, reinforcing by a row of interrupted sutures. If an exit is on the posterior wall of the stomach, the quickest repair is to enlarge the anterior wound and repair the posterior from the inside. There may be many perforations and all must be found and sutured. Autopsy records show a large proportion of missed perforations, the closure of which might have saved a life. In mass perforations, one author advises the exteriorization of the loop damaged beyond repair. Resections have such a high mortality that they should rarely be done unless absolutely unavoidable. Later, resection can be done more safely. Be sure duodenal and bile duct leaks are tight and wide drainage left, as escaping secretions damage surrounding tissues. Retroperitoneal damage often is the cause of late abscesses, and usually is safer let alone, draining later if necessary.

Injuries to the colon are not common. Frequently, contamination of the abdomen does not follow because of the presence of less fluid in the colon. They should always be drained, as, in spite of the type of repair, they may break down later.

When the rectum is perforated an incision must be made in the posterior perineum, removing the coccyx, if necessary, and providing wide drainage after repair.

The bladder is frequently injured and should be closed by a deep running suture just missing the mucosa, an interrupted row in the muscle, and another row of interrupted stay sutures in the peritoneum.

Injuries to the kidneys are rare. The patient's chance is better if they are not repaired, unless there is much hemorrhage. A later operation, opening an abscess or nephrectomy for a destroyed kidney, is much safer. Wounds involving the pancreas are very rare but usually fatal. The secretion causes digestion of the abdominal wall. Any damage should be repaired, bleeding stopped, and wide drainage left. Throughout the operation the patient must be watched for failing pulse and blood pressure, and the head of the table lowered in proportion to the fall. Before closing, the foreign body may be removed if easily found.

Débride the entrance wound if ragged, but do not waste time. Drainage must be left if an abdominal viscus is perforated, the organs badly damaged or probably infected. One cigaret drain may be sufficient; often one or two rubber tissue drains are added. The peritoneum should be closed with plain catgut. Chromic gut is best for buried sutures. Deep stay sutures of heavy waterproof material or nylon will help prevent wound failures. Silk, cotton or nylon should not be buried unless the wound is clean and dry. The skin may be closed with interrupted sutures of nylon, silk, cotton or clips. Often exit wounds should be débrided and drained. Save operating time whenever possible. In one large series re-

ported, when the operating time was under one hour most patients lived and when over one hour a large percentage died.

Postoperative Care.—The patient should be put to bed as quickly as possible, and external heat applied. If the abdomen is not contaminated, raise the foot of the bed; in a badly infected abdomen, the head of the bed should be elevated after a few hours to discourage subdiaphragmatic abscess. Nasal suction should be started as soon as the patient is conscious. In intestinal perforations nothing should be given by mouth for three days. Fluids should be administered in the form of intravenous glucose. If much blood is lost or shock is present, repeated transfusions should be given in proportion to the symptoms. If veins are inaccessible, some fluids can be given by hypodermoclysis. If no intestine was perforated, proctoclysis of glucose, soda, and water is useful. Prostigmin, 1 c.c. by hypodermic before the operation and repeated every four to six hours for three days, will often prevent abdominal distention. Metrazol, pituitrin, and pitressin also are recommended. A colonic tube will often relieve distention. Bronchitis, atelectasis, and pneumonia must be guarded against. All patients should have prophylactic tetanus serum.

Summary

1. Abdominal wounds in which perforation is suspected should be explored.

2. In case of much blood loss intravenous fluids should be given. Blood transfusions are best.

3. Shock must be treated and overcome before operation is attempted.

4. Incisions must be adequately large.

5. Operations should occupy as little time as possible.

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PHYSICAL EXAMINATIONS IN INDUSTRY

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PRE-EMPLOYMENT as well as periodic re-examinations are compulsory as affecting certain industries in many states of the Union through properly organized Boards of Industrial Hygiene which usually function hand in hand with the Workman's Compensation Act.

These examinations have for years been well organized and under state jurisdiction in the Carolinas and most of the seaboard states, because of occupational silicosis-asbestosis and other forms of pneumoconiosis; and all workers in these hazardous occupations are registered and compensated by their various states. Wisconsin is showing much activity in this di-

rection; and at present our own state of Minnesota has a Division of Industrial Hygiene which has been making a survey for nearly a year, its purpose being the classification and control of occupational diseases.

So far as I know, there are no such diseases charged against the operating end of the telephone business. Therefore, with us, this work is entirely voluntary, and its purpose is largely liaison between management and employe in the proper placement of workers on the basis of the mental and physical ability of the individual as well as the safety of fellow workmen in all departments, especially in the construction and maintenance of both outside and inside equipment. To quote an editorial in *The Journal of the American Medical Association:*

> One of the foremost objectives of Industrial Medicine is to fit every person to types and quantities of work according to his ability to perform such work continually without undue impairment, without injury to himself or to his fellow workman, and with profit to himself and his employer.

Preëmployment examinations in industry are only the primary steps in the individual's industrial health program and do not mean a requirement of one hundred per cent supermen and women. In over twenty years of this work, my own total rejections have been less than three per cent, while placements have been many times that; and a few were employed for rehabilitation after the last war. Our plan of examinations and placements for men is also that of the parent company—The American Telephone and Telegraph Company. It was carefully worked out by a council of medical directors and is similar to the physical examination procedure outlined by the Conference Board of Physicians in Industry. All men are stripped, and the examination is similar to that of the army. Partial examination may be made in some cases, and others may need special care.

New employes are graded A-B-C-D.

Class A.—Recommended for immediate employment in any position. Example: No physical impairment. Correction of carious teeth advised within six months.

Class B.—Recommended for employment in specific positions only. Example: Simple mitral heart disease; loss of vision, one eye—other eye normal; limited use of muscles of arm or leg; inguinal hernia controlled by truss. Persons employed in Class B should not be transferred without securing an opinion from the Medical Department.

Class C.—Recommended for employment after physical impairments have been corrected and then classed A or B. Example: Extensive caries of teeth; acute discharging ear; enlarged thyroid with symptoms; inguinal hernia without support.

Class D.—Not recommended for employment in any capacity. Example: Advanced tuberculosis; chronic trachoma; acute primary syphilis; true diabetes.

Great tact and kindliness must be exercised in dealing with all defectives in order not to discourage the applicant. In all the above cases, there is considerable allowable leeway, for example: under or overweight of 20 per cent; moderate impairment of vision and hearing; blood pressure variation, et cetera. All results and recommendations are forwarded to the employment department and are often discussed with them personally.

Blood Wassermann tests are usually routine; and I feel that industry will soon be doing routine Mantoux tests as well, with chest x-ray of the positive reactors. Widals and stool examinations if indicated are routine with food handlers. Periodic reëxaminations, including chest x-rays, are compulsory in many occupational disease districts and are reported periodically to the State Hygiene Boards. Industry in general, however, has found it valuable to combine this with accident prevention training by the Safety Engineering Department.

An ever-alert, health conscious management, however, is the best safeguard in industry and should supervise periodic examinations where they are not compulsory. With us, men over fifty years of age who are climbing poles should naturally be closely observed by the management and examined often.

All employes should be at liberty to ask for an examination and advice from the Medical Department through their department heads. If diagnosis is possible, or if further study and treatment is necessary, the individual should then be referred to the family physician along with a letter or telephone call giving all information possible and including any laboratory data obtained. In this way it is possible for the Medical Department to coöperate with the worker's physician; and every effort should be made to develop cordial relations with him.

The industrial physician should not treat any employe who needs home medical treatment. First Aid emergency care only should be furnished. For field accidents each crew should have "first aid" training and should carry "first aid" kits for this purpose. After the emergency care the family physician, the neighborhood doctor, or the hospital should be used, depending upon the gravity of the case.

Every effort should be made by the Medical Department in coöperation with the family physician to place the injured worker upon his return in some form of disability assignment. The greatest harmony and economy can thus be obtained for the benefit of all concerned.

In industry, as in other walks of life, cardiovascular and renal diseases are increasing and demand careful placement and checking. Often a little less work with a two-hour rest period at noon will keep these people on the job for many years. Definite periodic examinations should be made, and real interest shown in the individual to accomplish this.

The ever-present tuberculosis group gives the industrial physician his greatest opportunity in those districts having no occupational diseases. Many with arrested diseases are employed and re-employed, and there must of necessity be a clear-cut program of adequate periodic re-examinations in all of these cases with the complete coöperation of the individual and management with the Medical Department. Industry must assume its share of arrested tuberculosis cases existing in its community.

It is of interest to report the results obtained in checking several groups of tuberculosis exposures in some of our larger offices here in Saint Paul, Minneapolis, and Omaha. Out of a total of about two hundred Mantoux tests, over 60 per cent were positive in all ages, while over 75 per cent were found in those over thirty-five years of age. This is in considerable contrast to the results obtained in the school age group and in rural districts. In a small group of twenty-two employes just examined, fourteen were positive; and of these fourteen, ten had normal lungs, while four had demonstrable healed lesions, an incidence of nearly 30 per cent of arrested tuberculosis. Obviously, these cases need periodic re-examinations.

In conclusion, it is my opinion that the full time industrial physician of the future should have specialized training for this work, which requires acquaintance with management policy, public relations, employe relations, Industrial Commissions, Industrial Hygiene Boards, et cetera; and medical schools are already recognizing and meeting this need.

POLIOMYELITIS

(Continued from Page 934)

a higher attack rate than the males in every age group.

If, then, it is assumed that the suspicious cases as well as the definite cases were due to the poliomyelitis virus, one might hazard the opinion that although males more frequently experience involvement of the nervous system in infection with the poliomyelitis virus, females suffer a higher subclinical attack rate.

Summary

An epidemic of poliomyelitis is described which occurred in Minnesota in 1930, and was confined for the most part to the southwestern part of the state, a very rural area.

The radial spread from a central focus is shown.

Instances are given of the apparent spread through person-to-person contact.

Consideration is given to suspicious illnesses occurring in association with definite cases of the disease, and data presented which suggest possibly that upon infection with the poliomyelitis virus males are more apt to develop involvement of the nervous system and females are more apt to suffer subclinical attacks.

INFORMAL REMARKS AT TESTIMONIAL DINNER FOR DOCTORS A. R. COLVIN, J. F. CORBETT AND H. P. RITCHIE, CLINICAL PROFESSORS OF SURGERY*

OWEN H. WANGENSTEEN, M.D.
Toastmaster

HONORED Guests, Fellow Colleagues: We are met tonight to do honor to three of our Fellows who, by virtue of years of faithful, devoted and loyal service to the Medical School and University, are deserving of our highest praise. We all know Doctors Colvin, Corbett and Ritchie. They taught many of us. A whole generation of Medical School students at the University, as a matter of fact, has come under their stimulating influence.

It is my privilege tonight to call upon each one of them. It will be a real pleasure to hear, from their own lips, concerning their years of attachment to the Medical School. It is a duteous and pleasant obligation, as Chairman of the Department of Surgery, to say here that each of the men we are honoring tonight has made a contribution of major importance to the Department of Surgery. We honor them, not alone for their accomplishments, but also because of sterling qualities of heart and mind which command our admiration and respect.

I shall reverse the alphabetical roll call and we shall hear from Doctor Ritchie first. Dr. Harry Parks Ritchie was born in Wellington, Kansas. His father was Dean of the School for a number of years. And now, Wallace Ritchie, an alert participant in the activities of the Surgical Department and a product of the third generation, is continuing the lustrous record of the Ritchie family in the Medical School. I believe that I am correct in saying that Doctor Harry P. Ritchie, in point of years of service, is the oldest living active member of the Medical School Faculty. For, in 1894, Doctor Ritchie held an appointment as assistant in physiology. This is an approach to Surgery which many present aspirants for a career in the Department are using as a stepping stone. After receiving his M.D. degree from the Medical School in 1896, Doctor Ritchie entered practice and became identified later with the Department of Gynecology. Doctor Ritchie's first publication, as far as I can find, concerned "Migratory Pneumonia." This very afternoon, I learned for the first time that Doctor Ritchie took part in the Spanish War of 1898. His very good friend, the late Dr. A. A. Law, a distinguished member of the Department of Surgery, loved to speak of his exploits in that same conflict. Why Doctor Ritchie has been so reticent on the subject, I do not know, lest it be his innate modesty. When I first came to know Doctor Ritchie, in the period immediately following World War Number I, his principal activity at the University Hospital was operating chronic empyemas. Later, he was active in operating upon malignancies—an activity which excited, undoubtedly, his great interest in plastic surgery. In 1921 Doctor Ritchie published his first paper on "Congenital Clefts of the Lip and Palate." Reconstructive surgery has since become Doctor Ritchie's consuming interest, and he has made worthy contributions to the subject. In consequence of his interest, we have had at the University Hospital for years an unusually fine and active service of plastic surgery. Doctor Ritchie and I have changed shoes in the same dressing room for years and, in consequence, I have come to know him well and admire him greatly. It is my pleasure now to call on Doctor Ritchie.

HARRY PARKS RITCHIE, M.D.
Saint Paul, Minnesota

Dr. Wangensteen, Dean Diehl and Fellows of the Department:

I feel quite at home, with so many here with whom I have had something in common. It seems I have lived my whole life in the atmosphere of medicine, even before my parents brought a young lad of eight years old to Saint Paul in October 1881, which will be sixty years ago next October. We came here in order that Father could associate himself with Dr. Alexander J. Stone, who even in that early day showed the ability which was to make him one of the most expert and adept technical surgeons of my experience. The offices were at the Medical Arts Building of those days, at 4th and Jackson Streets and, of course, Parks' boy Harry was introduced to all the fraternity and had entree to all the offices in town.

There was J. H. Murphy of Civil War Fame, in whose office I first saw human blood in quantity. I got to know Dr. John F. Fulton, one of the keenest minds and with a political sense which had a great deal to do in determining the form and practice of medicine. Dr. C. Eugene Riggs, who at that time specialized in nervous diseases, became the head neurologist of the Northwest. Dr. Perry H. Millard, a man who had vision and ability and the faculty of translating vision into practical terms and bringing it to fruition (I think that's the word), the result of which we see today in our great Medical School, was a man of great activity, rather austere in manner, who permitted no sentiment or personal considerations to influence him in his great purpose. There was LeGrand N. Denslow, dapper in dress and smooth in manner, who was a consultant on skin diseases and who came to the frontier prepared by experience and study from the study of medicine in the East. Of course, there were many others. The only trouble in making such reminiscences is that they have no documentary support and may only be the impressions of a young lad, to be taken for what they are worth.

There was Dr. Parks Ritchie, who was introduced by that already well-known and estimable man, Dr. Alexander Stone. This man was in the group of Millard, Wheaton, Renz, Bean, Riggs and Denslow, who formed the Saint Paul Medical School. I remember the great thrill I had when Father announced that he was to be Professor of Obstetrics in the newly-formed Medical School: A professor in the family—Gee Whiz! I remember the discussion as to whether it would be possible to finance a trip East to prepare for such a responsible position. Finally it was decided that the trip should be made, and he went, and brought

*Sponsored by the Division of General Surgery of the Department of Surgery of the Medical School of the University of Minnesota and held at the Minnesota Union, June 10, 1941.

home all sorts of photographs of his teachers: Lusk, who was the top man on obstetrics in those days, Janeway, Austin Flint—names which stood at the top of the profession in those days, but which now are simply memories. I used to go to the Commencements of the School, only one of which I remember, but the memory of it has always been a great support to me when I try to talk offhand, as I am doing now. The valedictorian of the class was a handsome, upstanding, vigorous man, with a tendency towards the roly-poly type, whose name was Dr. Arthur J. Gillette, who became such a factor in the development of surgery in the State of Minnesota, and who left a monument in the Gillette State Hospital for Crippled Children. He forgot part of his address, but this seemed to have no effect upon his future marvelous position in medicine.

It was also known that a medical school had been formed in Minneapolis and we began to hear the names of Dunn, Moore and Dunsmore. The vision of Dr. Millard was the union of these two colleges, which was to be sponsored by the infant University of Minnesota. I cannot imagine a man more qualified to bring together these warring factions of St. Paul and Minneapolis. Even in those days, the profession in St. Paul was rapidly gaining a reputation of unity, consideration and camaraderie, which I think has continued over the years. Of course, it must be remembered that these men were all individuals who on their own efforts attained their position and sold their abilities to the public. Of course, the same situation applied to the men in Minneapolis, and this is simply a build-up for the marvelous administrative ability of Dr. Perry H. Millard. I have always thought that the influence upon the Legislature was in great part due to the fertile mind and ability of Dr. J. F. Fulton, but of course, the prime mover and master was Dr. Millard, who became not only Professor of Surgery but also the first Dean of the Medical School. Of course, he made a great job of controlling the individuals and forming a team, but I also see the political influence of Dr. Fulton in satisfying the members of the newly-formed faculty. Dr. Parks Ritchie left the Saint Paul Medical School to become Professor of Obstetrics in the Medical School at the University of Minnesota. I, being brought up in such an atmosphere and on speaking terms with every doctor in town, each of whom would say to me "Well, Harry, are you going to grow up to be a doctor like papa?", my future career was certainly mapped out, and when the time came to graduate from Saint Paul Central in 1890, the question came up as to what to do. I had some friends in Central who planned to go to Yale. Well, you may understand my parents' consternation when I made the announcement that I wanted to go to Yale—talk about Stuka dive bombers! Such a program meant a great sacrifice, but it is a great thing to have understanding parents. We looked over the prospectus, to find that there was a biology course which would be in effect a pre-medical course, a fundamental requirement today, but quite the exception in 1891. My friends were going into the academic department and in this connection a tragedy occurred in my life in the fact that one requirement for admission to the academic department was an examination in Greek which was not given in Saint Paul Central. So with my friends, I had to take a six-month course in Greek, before taking the examination. After it was all over, we found that the biology course in the academic department was a minor subject, whereas in the Sheffield Scientific School it was a major course, so I decided to transfer to the scientific course, which did not require Greek, so I had six months of agony for nothing. Ever after, if anyone happened to say the word "parasang" in my pressence he was liable to get a bust in the jaw.

Well, I know what a great sacrifice it was on the part of my parents to send me such a long distance from home under the added expense of a college career. It was not until the second year that I came into contact with one of the great men of my memory, Professor Russell H. Chittenden, who at that time was top man in the country in physiology, and physiological chemistry, and who with my father, Dr. Archibald MacLaren and Dr. James E. Moore, was a wonderful model for a young man to follow. Dr. Chittenden was a great teacher who had the faculty of putting a touch of romance into such a primary and factual subject as physiology. In fact, his insistence on study and his personal incentive was such that no one in the class would dare to go into the lectures unprepared, and when it came to actual work in the laboratory, his insistence on proper notebooks of the various experiments and results and their application was such that with his editorial review of them they were really excellent, worth-while records. Of course, I had written home about this wonderful course, and it came to the attention of Dr. Richard O. Beard, Professor of Physiology in the newly-formed Medical School. It has always been a great pleasure to me to remember Dr. Beard's suggestion that when my Yale tour was finished, he would give me a position in the department, with the intention of developing a laboratory course in physiological chemistry. I would have qualified for a new program of medical teaching instituted at Johns Hopkins University at Baltimore, which consisted in a four-year course for admission to which a college degree was required. If I had been admitted and graduated, I would have been in the first class graduated under the instruction of that marvelous group, Halsted, Osler, Welch and Kelly. In fact, a few of the members of the class went down, but the offer of the new job was too exciting to turn down, when at the same time I could live at home and earn a "U" fee of twenty dollars a month with remission of tuition dues.

Dr. Beard has never received sufficient recognition from the University and students for his work. He was a man devoted to his duties and he was really the first man I remember who talked about high standards for qualification in the study of medicine. Of course, his idea was that a man who could cross his t's and put the periods in the proper places was qualified to study medicine. It was quite the contrary with Dr. Parks Ritchie, who was always interested in the

individual and believed that the men who had to make a living and study at the same time with an urge to study medicine should be encouraged. Even today I hardly attend a medical meeting but what someone, who has developed into a pillar in his local community, comes to me and says that he never would have graduated if it had not been for the encouragement and support of my father, particularly during his deanship.

Well, it was a great thrill to study in the medical school in contact with such a dynamic person as Dr. Beard, with the definite purpose of establishing a new course in physiological chemistry. The insistence of Professor Chittenden on proper notes was a lifesaver. The course was a success and I think it is proper to tell a story I heard when I first started to study medicine. A demonstration was being made by Dr. Beard, in this particular the Biuret test for the end products of proteolytic digestion, which turned the fluid in the bottom of the test tube a beautiful blue color. Dr. Beard held it up to the light and dilated upon the beauty of the reaction and then passed the tube around to the students for close inspection. The story is that the test tube returned to him full of tobacco juice. The making of the blood, bile, digestion and urine experiment sheets and the contact with the slaughter houses for material and with Fairchild Brothers, and Foster for ferments was really very exciting. It took a lot of time, but I had credits in organic and inorganic chemistry which I tried to obtain from affidavits of my teachers in New Haven. But Professor Bell was hard boiled and I had to pass both written and oral examinations.

At the time of graduation I was anxious to apply my skimpy knowledge of medicine to the individual. Dr. Sedgwick was then practicing on the Range and he was anxious to get into some teaching position, and to my great relief and joy, I was able to turn over the work to Dr. Sedgwick, and, I felt sure, to the great relief and joy of Dr. Beard. Then came internship at the City and County Hospital in Saint Paul, in common with my beloved and admirable friends and classmates, Dr. Warren A. Dennis, Dr. Walter Ramsey and Frank Warren of Faribault. There I again came in contact with students and continued to study under such men as Dr. C. A. Wheaton, Bob Wheaton, John Rogers, J. Rothrock, Dr. A. MacLaren and Theodore F. DeWitt. That was the time when the antitoxin of diphtheria was just coming in and a newfangled gadget called the x-ray tube. In fact, Dr. DeWitt operated upon the first case in phich an x-ray picture was the guiding factor in the operation. Warren Dennis assisted and I gave the anesthetic which was part of my job as an intern. I got so that I could choke the patient promptly with the old ether cone, and those memories make me so grateful for the great developments and refinements in the anesthetic technique of today. There was a case with a bullet in the lower leg, and the only x-ray tube in the state was over at the Physical Department at the University, where the x-rays emanated from an old, obsolete static machine. The patient was taken to the University where Professor Jones took the picture. There was a dark spot on the film, which located the bullet.

The time came to terminate my internship and the question of the future again arose. My father, who worked like a couple of dogs all his life, wanted me to do something easier than general practice, and he suggested the nose and throat specialty. He said, "You must do it—just look at those fellows, Harry. They stick a wire up a nose and pull out fifty dollars." Of course, this a libel on the profession, but I soon found that in those days of the atomizer, the fellow who used the strongest solution of cocaine had the best practice. But I did get to the point where I could clip off the tops of tonsils with the guillotine as fast as anyone in town. I think it all right to say this, to show you the marvelous developments which have been made in sinus work and ear work in the meantime. Dr. MacLaren and Dr. DeWitt I had known during my internship at the City Hospital, where Warren Dennis was acknowledged to be the top member of the intern group, particularly qualified in general surgery, so he went to one end of the old Lowry Building with Dr. Wheaton and I went to the other end of the building with Dr. MacLaren and Dr. DeWitt, to find that the bulk of our work was in gynecology. So I became the third man in the group of MacLaren, DeWitt and Ritchie, with Ritchie written in the finest letters at the tail end of the letter heads.

When the Spanish-American war broke out, I was appointed to go with the 13th Minnesota. My opportunity came when two members who were already in the Minnesota Regiment of National Guard decided not to go, leaving two vacancies. I jumped at the chance, because I had made little progress in the practice of medicine in a year and there was nothing to give up. But to my pleasure, I found that I was again third man in the medical corps and my immediate superior was my boyhood friend, the late Dr. Arthur Ayer Law. From the educational standpoint, the trip in the Philippines was a dead loss, but the rough and tumble practice, the meeting of many wonderful men in the army and the excitement of the campaigns and the midnight sick calls on the march, made quite an experience. I found that with the younger boys, sick and far away from home, the kind of pill I gave them was in no way so important as the way it was given and that the assurance that I was interested in the case really was more valuable than any medicine could be. So there was a two-year hiatus in my contact with medical students. I do not see so very much difference between them and the boys and students of today. They are all kids with a future and a purpose, who need a little bit of support—to use the expression of my beloved friend, Arthur Law—"a bit of a touch of the shoulder."

Of course, there was a little bit of advertising connected with the position as surgeon of the 13th Minnesota, and when I returned in a year, Dr. MacLaren told me that in the meantime Dr. DeWitt had decided to retire from the practice of surgery. You can imagine the thrill that was mine when Dr. MacLaren

offered me a formal partnership. Well, I was again in contact with students, because, out of his own interest and loyalty, Dr. MacLaren had been giving a Thursday morning surgical clinic at St. Luke's Hospital. This was the beginning of a weekly clinic which was a great part of our life, the preparation and accomplishment of which was constantly in the mind of Dr. MacLaren. Until the time when the University Hospital opened in 1912, I do not believe a clinic was ever missed. The cases were all private patients, but such was the control of Dr. MacLaren over his people that I do not remember a complaint ever having been made. The caliber of the clinic was always on his mind, and, while it started out to be nothing but an operative clinic, it was on his instruction that I started to form a laboratory, because it was not at that time the custom to have a hospital equipped with a laboratory. This was done at our own expense. The University was combed to find someone to act as a laboratory technician, and I was fortunate in finding, not a laboratory technician, but an artist from another department, Miss Lotz, who had the spirit, ability and initiative to learn the method of sections, and who trained herself in stenography and shorthand. So we began to send all the pathologic specimens to the laboratory to be classified and preserved in glass jars, in an effort to have museum material to maintain the clinic should the operative cases ever fail. The pathologic interpretation of our sections was more or less the weak part of the setup, because, although I had had some training in pathology with Dr. Wesbrook and his assistant, S. Marx White, there was always a feeling of uncertainty in pathologic diagnosis. On the old records I see the names of John L. Rothrock, Ernest Richards, Edgar Norris and a number of others. I had the idea of supplementing our operative clinic with surgical pathology: here is the gross tumor, here is the section, here is a statement of the case leading up to the condition. I had worked hard to gather a group of cases and had sections of the breast showing practically all the pathologic conditions then known. Dr. MacLaren was very much interested and one morning he turned the clinic over to me. On the table I had all the material, but during the morning I could not get the attention of the class and I was very much disappointed as I thought it was my fault for not putting some romance, as Dr. Chittenden had in his lectures, into the clinic. I had one friend in the class, whom I approached after the clinic and asked, "What was the matter?", and he said, "We are so sick of seeing dead things that we can't stand it any more," so all the material was only brought out on occasion. With Dr. MacLaren, the clinic always came first, but I remember my father talking about a colleague who had missed some hours with his students and who was being criticized by him for missing his engagement. His excuse was that he did not have any material, and I remember Father saying, "You must meet your hour. Just look at Jimmy Moore—all he needs is a bone—any old bone—and he can build a clinic on it," which he did, for he was in the same class with Dr. MacLaren with respect to his duties.

Well, the policy of the University changed, with the idea of eliminating the private class of individuals, and the plan of putting the operative clinic in the City and County Hospital of Saint Paul and the City Hospital in Minneapolis and the newly-formed University Hospital, which had been built through the very active work of Dr. James E. Moore. Even before the Elliott Memorial Hospital was built in its present position, a beginning had been made in some house over on Washington Avenue.

When I returned from the Philippines, my beloved friend, Dr. Alexander J. Stone, immediately asked me to come into his department of gynecology. Our offices were nearby and it was no uncommon occurrence to have him run into my office and say, "Harry, I have a lecture in half an hour at the University on such and such a subject, and I can't go. I want you to go over and take the hour." I think this is worthy of record, to show how loosely in some instances the formal didactic lectures were made. When the temporary hospital started, Dr. Stone came into the office and said, "There is a case on my service, with a vesicovaginal fistula and I want you to go over and sew it up. Well, of course, I had seen the operation when I was assisting Dr. MacLaren, and I at least knew where the parts were, but for any extensive experience, or taking the responsibility of such a new case, it was another example of the form of teaching of those days. I would like to add that the fistula in this case was closed, mirabile dictu.

Well, there came a time when the surgical staff was asked to resign, with the idea of appointing those on the service in Saint Paul and Minneapolis and at the University, thus revising the personnel of the faculty to give greater control to the University authorities. Dennis and I had become very close friends, probably for the reason that we were in different ends of the building and our cases did not often cross, so we were not competitors. We were left out on a limb, as a result of the changing of the faculty. We decided between us that we were good surgeons and qualified for appointment on the staff, so we made a trip to Minneapolis for a personal consultation with Dr. J. E. Moore, who was to be the head of the surgical department. It was an anxious time. I was sure that Dennis would get it, because he was the top man among us, and when I was also included, it meant a change-over from the gynecological department to surgery. Happily, I was finally appointed, and the staff was formed, with Dr. Moore as chief. Dr. J. Clark Stewart, whom I do not remember as having a formal appointment, was in effect, associate chief. There were two services, one red and one blue. Dr. MacLaren was chief of one, with his associates, Dr. Arthur Strachauer and Dr. Warren Dennis. The other service was headed by my friend and comrade, Arthur Law. I was the second man and Earl Hare third man. Dr. J. Clark Stewart was the first man to concentrate on the problem of cancer in this part of the country, and, of course, when the University Hospital opened, all the neglected cases from all over the State came in. So all the younger fellows

and particularly Earl Hare and myself became quite interested in these problems. Dr. Stewart taught that the only way to treat cancer was to destroy it. We were limited to surgical removal, when it could be safely done, or cauterizing, in position. It was a great advance when the cautery excision came in. Dr. Earl Hare was a real, competent anatomical surgeon and Dr. Stewart not infrequently turned over the problems to us, with the result that many of them had serious cosmetic deformities as a result of the treatment. It was this group that got me interested in the problems of repair, because when they went home with awful deformities, they were a bad advertisement to those in the community who had beginning malignancies, but who would be deterred from seeking treatment at the time of possible cure and would delay treatment for fear of a terrible deformity. So we began to think of making a repair some way, with flaps and skin grafts. When I see the marvelous work being done all over the country and at our place, I have to go back to the days, when, for lack of experience or direction, the result was not always satisfactory. It was a wonderful time for all the younger members of the staff, because it was truly a general surgical service. Before the time when gynecology and urology were sloughed off from the Department of Surgery for special teaching, we had to pitch in and do the work on our own, or more often under the direction of the senior members. For instance, Dr. Arthur Strachauer and I used to contest in our cystoscopic work to see who, in doing a pyelogram, could get the most collargol on the ceiling.

One story might be worth telling. It certainly had a great influence on my future work. On Arthur's service, there was a case of procidentia, which I decided was a typical one for a Watkins interposition operation. I had gone to Chicago, met Dr. Watkins under Dr. MacLaren's introduction, seen the operation several times, and, with Dr. MacLaren, had done a few operations, so I decided to try it. Being the first one of this kind in the hospital, the staff was present. You know, it is easy to get the vaginal mucous membrane off the bladder, it is difficult to separate the bladder from the uterus, but it can be done safely and easily up to the point of entry into the peritoneal cavity. In this case, everything went well up to the point of entry into the peritoneal cavity, at which time I could see myself entering the bladder and making a mess of the operation. So with extra care and timidity, time went by to a point where I could hear the staff changing over from the left to the right foot. Finally, Dr. Moore came up and remarked, "Well, Harry, what are you going to do next?" Even today, when I get into a blind spot in an operation, I can hear him say, "Well, Harry, what are you going to do next?"

Well, it was certainly a happy family. No one of the staff had an attitude other than consideration and helpfulness, and, as I look back, good surgery was done. Dr. Moore was a real leader who had the interests of the patients at heart. Of course, in our service, Arthur Law and I had so many things in common that we got along beautifully. On my part there was ever-increasing admiration for his beautiful, exquisite deftness in his surgical work, and I think I saw the same spirit with Drs. MacLaren and Warren Dennis.

Unfortunately, one day in our general rounds, which Dr. Moore characteristically designated as "Grand Rounds", when we saw all the patients, there happened to be three new cases of a congenital deformity known over the years as harelip and cleft-palate. I had seen Dr. Strachauer and Dr. Law do these operations, but I had never done any myself. Nobody seemed to be particularly interested in them, and Dr. Moore turned to me and said "Harry, why don't you see what you can do with these cases?" and thus came to me a problem which has interested me all the succeeding years. In one way it has been a deterrent to the development of a Department of Reconstructive Surgery, for although the other flaps and skin grafts had always been of great interest, these congenital deformities began to flood in in such numbers that there was really no time to do anything else; so when Logan Leven came to the hospital and indicated an interest in these problems, he was met with a reception cordial to the point of embarrassing him. We found also that there were a great many problems that neither one of us was competent to handle, and I found Dr. Carl Waldron to come over and help out. When I go back to the time when my father used to talk about "those tooth carpenters," and see the development of the dental school into a real medical science under Dean Lasby, Dr. Rudolph and Dr. Carl Waldron, I feel that this department has kept pace with the development of scientific medicine. I feel that, in retiring from the active staff, these problems are in most competent hands, with Dr. Leven, with the surest possibility of future development in the care of this group of cases at the university. I have always been most grateful to Dr. Waldron, because through him I have come in contact with an interesting group of men all over the country, who are devoting their lives to these problems on a specialty basis, an attitude which I could never bring myself to assume, for fear I would get bored and limited. I think I am imbued with the idea of the general practitioner in my attitude towards the problems of surgery. Dr. Wangensteen has called attention to the plastic department as being one of the best in the country. Well, I will say from observation elsewhere that it is not, but that it has that possibility.

So the service went until the War, when the formation of the Base Hospital decimated our staff, which meant that those of us who had to stay home had to double up in the matter of work, and also manage the didactic teaching. That was the time when the four-quarter plan was begun. One year I had to give a course on "Principles of Surgery" twice in one year, and I got so stale that I have put the word "principles" in the same class as the word "Parasang." Anyway, we survived and there was so much to do that we invited in fellows for a six-month service. I thus got to know a splendid group of the younger fellows who

caught the spirit of the University and contributed to the development of the Department. There were men like James Johnson, Roscoe Webb, George Dunn and many others who helped with the care of patients and participated actively in teaching.

This went on until we had some sad news. Dr. J. E. Moore was sick with pernicious anemia. Those were the days when treatment by transfusion was the accepted thing and Dr. Moore had back of him the whole student body, but all the care did not do any good and he finally died. It was a great loss to the University and the Department. I always thought it was quite a coincidence that dynamic men like Dr. Perry Millard and Dr. James E. Moore should both have died from a disease for which today so much can be done.

Outside of the active work done, one of the privileges of belonging to the staff was the opportunity of meeting and knowing and in some instances knowing intimately the newer and keener minds among the students. I think everybody who has been familiar with the student body agrees that the caliber of the students has improved right along. I think I notice a deeper interest on the part of the present classes, certainly a closer attention, and different conduct from the time when a student was taken from the first row and passed up to the top row by his classmates. Medicine has become a serious business, and the old rough-house days, while they were of fond memory, were not always conducive to scientific medicine.

Once in a while, we see some student who by his industry calls himself to the attention of every teacher with whom he comes in contact. It was great luck for the Surgical Department when Owen H. Wangensteen decided to become a surgeon, and his early promise as a student has been more than generously fulfilled. I think the status of our department is much stronger than most of the departments I know of elsewhere in the country, by the fact that our chief has been home grown, and I look with amazement and joy at the ability he has shown as an organizer, administrator and investigator of not only the academic but the surgical problems vital to the care of patients. He has made himself a top practical, technical surgeon. I am familiar with many departments in person, with the particular heads of the departments of surgery elsewhere in the country, and I can truthfully say that our department, at the present time, presages the top future medical school in the country.

I knew something of the problems of the deanship during the years when Parks Ritchie was Dean of the Medical School, and I want to congratulate Dr. Diehl on his assuming and carrying through what I know to be a tremendous job. Of course, his interest is in the school, but I think I will give him a little advice—to give particular attention to the Surgical Department.

I have talked too long and I want to say just a word in conclusion. I have seen three forms of teaching surgery:

1. The clinics on private patients, with the contributions of loyal men such as Dr. MacLaren, Dr. C. A. Wheaton, Dr. Alexander J. Stone and Dr. Harry O'Brien of St. Paul, Dr. Dunn, Dr. Moore, Dr. Dunsmore and Dr. Amos Abbott of Minneapolis, and others whom I haven't time to mention.

2. We had the half-time men on year-round service of the original staff. Dr. Strachauer reminds me that he and I are the only living members of the original staff.

3. The present setup consists of full-time men under the direction of Dr. Wangensteen.

I think under the present plan the patients get better and more expert and continuous care than ever before. I think that surely the opportunity and urge to produce something and solve many unsolvable problems is better carried on by the constant attention of the full-time men than by half-time men who have to divide their efforts between the demands of public work and the great personal problem of earning a living.

I can't conclude without a word about Dr. Archibald MacLaren, with whom I was associated for twenty-five years, during a period of great volume of work. I never could have afforded to give so much time to the University had it not been for his support and encouragement. Dr. MacLaren was in his conduct fundamentally and intellectually an honest man—honest with himself, and honest with his patients. One story may illustrate his attitude to his work. So often when discussing some case he would say, "Well, Harry, of course you can operate, but will you do the patient any good?" This has influenced me ever since. Even now when I have a problem of procedure across my consultation desk, the spirit of Dr. MacLaren shouts in my right ear the above statement. I have thought that if there should come a time when I had to advertise for patients that I would ask him to shout it in my left ear, where my hearing is not so acute.

I would like to plug Dr. Parks Ritchie, who was an ideal husband and father, and who, I think, carried with him the teaching of his Presbyterian minister father in his ideal of service to his patients. He carried in his little black bag, consolation, advice and a great fund of stories and quotations, which so many times emphasized a point or took the strain out of a controversy. Even his bill heads softened the blow, as around the margin were quotations, only one of which I can remember: "Hope is a good breakfast but a poor supper." I am sure this brought prompt payment of his modest charges.

I would like to take the time to pay my respects to a number of men, but it would not be pertinent to the Surgical Department, and so I will close, saying that I have been inordinately proud of my position, that it has been a wonderful opportunity and, when all is said and done, I believe that I got more out of the School than the School got out of me.

Dr. Wangensteen

DR. J. FRANK CORBETT was born in Chippewa Falls, Wisconsin. He received his M.D. degree from our Medical School in 1896. Doctors Corbett and Ritchie were classmates. Doctor Corbett's first publications were essentially bacteriological in nature and dealt with typhoid fever and the water supply in Minneapolis. Doctor Corbett was the first Surgical Experimentalist, west of Chicago and Milwaukee, where Nicholas Semm had preceded him in a similar interest. Doctor Corbett established, in our Department of Surgery, a fine Experimental Laboratory. There he worked ardently for years, employing combinations of pathologic and physiologic approaches to surgical disorders. Between the years 1908 and 1915, he published several papers on experimental aspects of surgical problems. His chief contributions related to shock and the behavior of the adrenal glands in shock and to blood vessel suture. He concerned himself also with the problem of adhesion formation after laparotomy. With World War I, Doctor Corbett's interest focused sharply on neurosurgery. A score of classes of our medical students have profited immensely because of Doctor Corbett's studies in nerve repair. During my days as a medical student, Doctor Corbett was one of our most esteemed and best loved teachers. When Doctor Corbett left the University as a full-time teacher to enter practice and take over the duties of Surgeon-in-Chief of the Minneapolis General Hospital, the senior class in medicine, of which I was a member, presented Doctor Corbett with a loving cup as a token of our admiration and regard for him as a teacher. Through the years, his interest in teaching has not flagged. A year ago, Doctor Corbett became Clinical Professor Emeritus. Many of us, who are here tonight, got our first orientation in the fundamental principles of surgery from him. It is now our pleasure to hear from Doctor Corbett.

J. FRANK CORBETT, M.D.
Minneapolis, Minnesota

Dr. Diehl, Dean of the Medical School; Dr. Wangensteen, Chief of the Department of Surgery; members of the Surgical Staff and my associates in the profession, I greet you. Tonight I do not have to rely on the comfort one gathers from reading the "Compensation of Age" in Cicero's *de Senectute*. Your assembly with its kindly spirit has done so much to reconcile me that I do not feel the age of retirement is anything to look upon with regret. It is rather a joyful occasion. I can now look upon advancing age through the eyes of Cicero who tells us it is the ripening of seed or fruit that is as important in nature's cycle as the germination of the seed or the blossom.

I came here to study medicine in 1893 as a student. At that time the Medical School was housed almost in its entirety in a building known as Medical Hall, a brown stone building on the old campus. A long shed-like building housed Chemistry and Histology and Pathology in addition. I shall beg leave to call your attention to the men who at this time gave their services to the field of surgery. As I journeyed along as student and later as a teacher, there seemed to be three distinct cycles of men. First the pioneers. These were the teachers of my student days. Second, those who came to surgery through apprenticeship. And third, the Graduate School of Medicine.

I shall detail the names and achievement of the pioneers, men who were giants in the profession, men who by inherent ability, perseverence and hard work, aided by good judgment and skill, achieved the seemingly impossible. They had no training except such as was dug out by their own effort of a very incomplete literature existing at that time. Without the x-ray or the laboratory they made accurate diagnosis and proved their findings by operation. Aided by their fingers and other senses only, they diagnosed pathology well, that today with all our assistance is a difficult problem.

Among the pioneers Perry Millard, originally of Stillwater, a graduate of Rush Medical School in 1872, was in every sense of the word a prairie doctor. He was Dean of the Medical School in 1888 to 1897, and Professor of Surgery. His lectures were colored with diathesis and dyscrasia, somewhat incomprehensible to most of us. But whatever he lacked in delivery or erudition he compensated for as an organizer. He did at least three things. First, he was the author and inspiration of the laws that govern the practice of medicine in the State of Minnesota. Second, he started the machinery for the consolidation of all the privately owned medical schools in the state into the University, an undertaking not completely consummated until 1908. This was accomplished by surrender of the charters of these poorly equipped private medical schools. Millard made this possible by introduction of an act of legislation to concentrate all medical teaching in the hands of the University. As a result, a medical school in the University was established on a firm foundation. Third, it was made possible to place Medical Hall on the campus largely through his efforts. A large amount of money was contributed by Millard for this purpose.

Of a different type was Dr. Charles A. Wheaton, a graduate of Harvard Medical School in 1877, a man of pleasing personality, with an almost perfect physical frame. His clinics were attended with utmost fidelity and enthusiasm. As we sat on the benches he brought to light with his scapel the pathology that he knew before was there. He would tell us the history, the physical findings, the reasons for diagnosing the condition. This was done by simple physical examination aided by a great fund of knowledge concerning the natural history of the condition under consideration and all controlled by excellent judgment. Keen observation, a good memory of medical pictures that he had stored in his mind and judgment were his great equipments. One realized that only an exceptionally well-gifted man could be a surgeon when they watched Charles Wheaton.

The man whom I knew most intimately on the surgical staff was James Dunn. He, too, was a prairie doctor but by hard work, close study and determination became a great master of surgery. I will detail somewhat his life. He had supported himself by manual labor at the age of fifteen and struggled through Normal School. He managed to work his way through the medical school, graduating from the University of the City of New York in 1878. His record next shows him as Professor of Natural Science in Mankato. Later

he started to practice in Shakopee. A visit to Europe was provided for and made in 1883 and he attended Vienna and Heidelberg. The Minnesota Hospital College, one of the private institutions later amalgamated into the University Medical School, had for its domicile the Winslow House. Here, Dr. Dunn served as Professor of Genito-Urinary Diseases from 1885 to 1889. Dunn was a self-made man, an indefatigable worker throwing into his work an energy that often exhausted him. He was fearless in his honesty, always ready to uphold what seemed to him right in his dealings with his associates. All I want to say is—he was my friend. As I sat on the benches of his operating room I realized that he was master of his profession. Without training he had absorbed by careful study the genius of the masters of Europe. I remember pictures of Von Langenbeck and Von Bergmann that hung in his office. Virchow, Billroth and Fenger were his constant companions, though miles separated them physically.

Dr. A. W. Abbott worked his way through two years at Dartmouth, enlisted as a drummer boy in the Civil War. He fought his way through the College of Physicians and Surgeons in New York. His first educational activities consisted in teaching anatomy at the St. Paul Medical College, an institution later incorporated with the University Medical School. In 1881 he was one of the Founders of the Minnesota College Hospital, where he was Professor of Anatomy and Gynecology. He was a close student of pathology and with Dr. J. Clark Stewart and F. F. Wesbrook, founded the Minnesota Pathological Society. His records are a model in every respect. Over fifty contributions are recorded, among them the classic on intussusception.

Dr. F. A. Dunsmoor thrilled us with his brilliant operative work. His quick judgment and clever technique were never surpassed. He too was a Minnesota product who conquered by his own ability. He was genuine and remarkable in friendliness and interest in every one.

Dr. Arthur Law received his training from Dunsmoor that stretched through a period of years.

J. Clark Stewart originally taught histology and pathology, and was one of the most generous hearted men that ever lived. He set aside his own personal prestige for the good of the University. Were it not for his sacrifice of self, the Department of Histology and later the Institute of Anatomy and the Institute of Pathology would never have come into existence. Again he stood aside for me, that I might develop the Laboratory of Experimental Surgery. He later worked into a study of tumors and before his death the tumor clinic at the University Hospital was established. He had wide vision and unselfishly stimulated others to develop opportunities that he created for them. His collection of lantern slides of tumors was enormous.

James E. Moore, a pioneer, developed but was not trained in the field of railroad surgery, with its amputations and other difficult problems. There was no one to train him. He trained his senior, Dr. A. A. Ames. He developed other men, most of whose names appear in the second group—the Apprenticed Surgeon. We all, of that era, owe him a great deal, not alone for the voluminous literature and his talks in lecture rooms but even more for the interest and help he gave us in his private office and in his consultations. I think Dr. Ritchie would never have done his cleft palate work had it not been for the impetus Moore gave him. His most classic publication was on osteomyelitis, selected from a long list.

Archibald MacLaren leaves a pleasant memory. I will quote, "A host of men can testify to the profound impression given not by any showy demonstration but by imparting to others, simply some thing of his own knowledge, his remarkable and discriminating conversation, his enthusiasm, his high ideal and fine ethical standards which were a part of him." (Charles Lyman Greene).

While the next man of whom I speak was not a surgeon, I must pay tribute to Dr. Parks Ritchie, Dean of the school immediately after my undergraduate days. He was a delightful man, always interested in all of us, our friend, our counsellor and our idol.

Both Charles and William Mayo were pioneers who succeeded past wildest dreams, through their inherent ability. Their lives are all too well before you to make comment necessary. While they themselves were at one time pioneers, their influence was chiefly brought to bear when the graduate school was established, and they finally developed all the laboratory methods, to the ultimate.

As to the early teachers, these self-made courageous resourceful supermen were pioneers. Only an exceptional man could do what they did with their resources. They had none of the modern aids to diagnose, such as the laboratory, the x-ray, the electrocardiogram, or even the sphygmomanometer. The work of the biochemist, the study of the blood and accurate means of determining bodily function that we have today were then unknown. Blood examination was seldom or ever done. Determination had to be made with the fingers and eyes and ears of the diagnostician and these meager data reasoned into a conclusion. The tape measure took the place of the x-ray. I have actually seen these men make a diagnosis from the appearance of the patient. I am inserting a discription of shock that illustrates what I mean by stored pictures that were drawn upon. "The injured man lies perfectly quiet and paid no attention to anything about him. His face was drawn and peculiarly elongated, the forehead wrinkled and nostrils dilated. His weary lusterless eyes were deeply sunk in their sockets, half covered by drooping lids and surrounded by heavy rings. The pupils were dilated and reacted sluggishly to light. The eyes had a glassy and vacant expression. The skin and visible mucous membranes had a marble-like pallor. Large drops of sweat stood out on his forehead. The temperature was subnormal. The sensibility of the entire body was greatly reduced. The patient reacted slightly to only painful impressions. No spontaneous movements were made by the patient. On repeated and urgent requests he showed he could

execute limited brief movement with his extremities. The almost imperceptible pulse was rapid, irregular and unequal. The arteries were narrow and of low tension. The patient answered slowly, reluctantly and only after repeated questioning. On repeated questioning the patient complained of cold, faintness and deadness of all parts of body. The respiration was irregular, abnormally deep sighing respiration interchanging with rapid and superficial ones."

Dunsmoor recognized typhoid by its odor and with certainty. Moore by pressing the limb of a patient, could determine osteomyelitis. The cry of an infant told Abbott of intussusception that he verified by feeling the abdomen with his trained finger. Dunn could locate stone in bladder by the click of his sound. In the same way kidney stones and ureteral stones were recognized. Again, Moore made accurate pictures of his fractures by measurement, by position of limb, by reaction of muscles aided alone by his memory and knowledge of other cases. Bone tumors were diagnosed without x-ray. Gangrene was predicted by the peripheral pulse. These men adapted laboratory methods as soon as they presented. Dunn's x-ray equipment consisted of an old x-ray machine and many glass plates. Sometimes he obtained good pictures of a Colles' fracture by the sweat of his brow. Cancer of the stomach in the early stages was recognized by considering the story of the development and by the appearance of the patient. The color, anemia and loss of subcutaneous fat was taken into account. In appendicitis, physical signs alone and progressive history of the case gave these men courage to operate. It is true that they had microscopes and test tubes but these things had later to be devoloped into useful instruments. Basal metabolism was undreamed of. Goiters were recognized by their clinical syndromes and classed accordingly. Such simple things as loss of weight and strength, tachycardia, tremor, temperature of skin and exophthalmos led to the correct answer.

These men established the department of surgery and then took upon themselves the training of assistants and later practically all of these apprenticed men became surgeons. I had the opportunity of close friendship with John B. Murphy, Harvey Cushing, Alexis Carrel, Charles Frazier, Dean Lewis, Carl Huber, an anatomist with a surgical mind, the Scotsman Binnie, Robert Coffey, the Mayos and also Crile, who visited me at the Experimental Laboratory. I received much from these men but their glory does not lessen the attainment of our Minnesota pioneer surgeons. This is true too of European surgeons, whom I met casually at the International Congress of Surgeons.

Intestinal obstruction seemed to be the stumbling block of the older men and remained so until Wangensteen, a product of the Graduate School, wrote his thesis. Yet Dunn handled this problem nearly as well. A man not connected with the University, my Preceptor as a student, Dr. W. E. Rochford, acquainted me with principles of surgery, a subject I had the pleasure to teach later. I wish to call attention to this because of the debt I owe him.

After graduation I entered almost immediately the teaching ranks and the second transitional group, which I have termed training by apprenticeship. By this I mean, they spent three or more years training under a surgeon. These men associated as teachers were—Arthur Law, H. P. Ritchie, R. E. Farr, A. C. Strachauer, Warren Dennis, A. R. Colvin and myself. Warren Dennis stands out as the brainiest and brightest man in my class. He was a hard worker, searched after truth, and was honest and brilliant in his work.

Arnold Schwyzer, I put in a class by himself. Trained by Kocher, he excelled his master in all he did. He brought not only medical training from Europe to America but the general culture as well. He is broad in his accomplishments, as he is superior in surgery.

With mere mention of these men whose efforts are familiar to you all I will pass to the Graduate School which I will designate the Modern Miracle. The graduate school has taken a large number of medical graduates and trained them in three years so that they are as far advanced in the science and art of surgery as we were after a lifetime of effort. This has been the product of the Graduate School and the Mayo Foundation. Will and Charles Mayo and Dean Ford had the vision to plan this and the ability to make the dream come true. Four years in undergraduate school and three years postgraduate work in the laboratories of the fundamental sciences and in the laboratory of the bedside and in the operating room have not only laid a foundation but actually developed men into surgeons in this short period of time. I have watched these men in the Experimental Laboratory and worked with them in the University Hospital and often obtained more from them than I gave. As an example, I will point to Dr. Wangensteen, who mounted to dizzy heights almost immediately after obtaining his Ph.D. and demonstrated his ability as a teacher of surgeons. With him he has gathered a group of men, of whom much the same might be said. They are present and you know them. Almost all the strategic positions in the Department of Surgery body are filled by men trained in the Graduate School. I remember Dr. Wangensteen as a student. It was his Class that presented me with a loving cup that I keep in my office where I can see it every day. It is very dear to my heart and is one of my cherished possessions.

Dr. Wangensteen

DR. ALEXANDER R. COLVIN was born in Teeswater, Ontario. His medical training was secured at McGill University in Montreal, where he graduated in 1894. Doctor Colvin became identified with the Department of Surgery more than forty years ago, having been appointed Clinical Assistant in 1900. Doctor Colvin's first publication, in 1902, dealt with lodgment of a coin in the esophagus. Early in his career, Doctor Colvin felt an urge to give special attention to surgical pathology and spent time pursuing this interest abroad in the Surgical Clinic of Professor Mikulicz at Breslau, as well as with Doctor Bloodgood at Baltimore. Doctor Colvin's writings and teachings have reflected directly, throughout the years, this keen interest in pathology, as a proper background for surgery. Doctor Colvin's

interest in teaching has become a matter of common knowledge amongst his associates. For years, without any emolument from either the University or the Ancker Hospital, the place of his chief activity, he has given freely of his time to students, staff and patients. I am told that he continues still to devote more time to his activities at the Ancker Hospital than to his practice. Doctor Colvin has learned that the tissues of the poor are equally as interesting as those of patients who can pay. The influence of Doctor Colvin's activity and precepts upon the Ancker Hospital and, therefore, also upon the Medical School as well, is difficult to measure. It is the product of a lifetime of earnest, high-minded endeavor, motivated by uncompromising principles of honesty and integrity. Men like Doctor Colvin build institutions. Teaching and the Ancker Hospital have been his life's work. It is my privilege now to call upon Doctor Colvin.

ALEXANDER R. COLVIN, M.D.
Saint Paul, Minnesota

I have more to be thankful for than the preceding speakers for, having come, a stranger, from Canada, the great kindness and warm-hearted reception accorded the young doctor when he began practice in Saint Paul in 1896 have always been and always will be remembered with great appreciation and pleasure. I soon learned that the profession in Saint Paul had a nationwide recognition for good fellowship. Harry Ritchie's father was among the group of men in Saint Paul at that time connected with the medical school and he soon became dean of the medical faculty. Before long he invited me to become an assistant in the Department of Surgery, and again I was made to feel the kind consideration of a big-hearted man. It is fine to be associated with the third generation in the person of Harry's son, Wallace, who is working with me at the Ancker Hospital, and it is an association which I feel sure is mutually pleasant.

Harry Ritchie, Warren Dennis and Walter Ramsey were interns at the City and County Hospital when I started my work and it was a pleasure to form such friendly relations so early in my life in Saint Paul. Very soon Harry, Warren Dennis, Jud Goodrich, John Rogers and I were dissecting during the winter months in the morgue, and I was spending much time doing dog surgery with Dr. Price, a veterinarian from McGill. He stole about a dog a week.

When I first came to Minnesota I was delighted to find its hospitals and medical profession so far advanced. The comparatively new St. Joseph's, St. Luke's and City and County Hospitals were then on a par with the hospitals of the older medical centers I had left, and I soon discovered that in the profession in the Twin Cities and at the medical school were men of outstanding character and ability. The number of Minnesota graduates of fine professional attainments in this and surrounding states is evidence of what I have just said.

I wish to express at this time a tribute to a man who made a profound impression upon me. I always felt that it would be difficult to convey in words what I felt and still feel for Dr. Charles Wheaton. Dr. John Rogers, first his assistant and later his partner in practice and himself a fine surgeon, spoke of him in *Surgery, Gynecology and Obstetrics,* in 1923, as one of the famous American surgeons. I was glad to find this writing done with so much feeling. It will repay you to look up this article if you are interested in the history of the Department of Surgery at the Medical School. I recognized at once a master surgeon much of the same type with whom I had been associated in my two years of house surgeonship at the Royal Victoria Hospital in Montreal.

Dr. Wheaton had come to Minnesota in 1879, a graduate of Harvard Medical School having interned under Cheever at the Boston City and Massachusetts General Hospitals. He worked for many years in a large general practice and became recognized as the leading surgeon between here and the Pacific Coast, and as Dr. Rogers has well said, "he put surgery on the map in the Northwest." He had an earnest, sincere, kind and compelling affection, was wise and sympathetic in his acceptance of his fellows, interested in and helpful to the younger members of the profession, and a hard worker. He was one of the founders of the medical school and head of the surgical department for many years. His was a striking personality when at work, compelling attention by virtue of a blending of the characteristics I have tried to describe accompanied with a mastery of surgical science. He held his science high and was possessed of that becoming humility, an attribute of all great men in medicine who think of the magnitude and responsibilities of medicine.

I became associated with him in practice at a later time when he was relinquishing his hold but it was during my first years in Saint Paul that I really learned most from him and received much inspiration as a privileged on-looker, and in a sense a postgraduate student. I felt that I was still privileged to continue working under the same quality of leader that I had left behind at the Royal Victoria Hospital.

"I have," said he "worked alone," meaning that in his early work he lacked the association of master minds. One of the few times I saw him display marked emotion was on the occasion of a visit of Dr. Maurice Richardson of Boston with whom he had graduated and interned in the Boston City and Massachusetts General Hospitals under Cheever. I was away over in Breslau, Germany, in 1903 when the renowned surgeon, Mikulicz, made a trip to the United States to attend a surgical congress. On his return, in speaking of American surgeons, he told me that "Richardson was most congenial." I asked him if he had met Dr. Wheaton. He replied that he had and that Dr. Wheaton had made a great impression upon him.

Doctor Wheaton was a man who with a larger and wider association would have risen to unknown heights. James Dunn, James Moore, Everton Abbott and Arch MacLaren, who were associated with him in the department, were all men esteemed and appreciated by their fellows.

Dean Lyon once said, "We will make our own chief of the department from among our own graduates," and in the course of events and in the development of

the surgical department the school was wise enough to encourage and promote an able young man. Doctor Wangensteen was a fortunate choice and along with the school has now come to be classed among the leaders. It is not amiss to say that although he is much younger than the older members of the department he has earned their respect, admiration, and loyalty.

Dr. Wangensteen

DR. A. C. STRACHAUER, my preceptor and predecessor, was Chairman of the Department of Surgery over a period of several years, when the activity of our colleagues, whom we are honoring tonight, was at its peak. Dr. Strachauer was in large measure responsible for the arrangement which assured men in the Surgical Fellowship plan of training, real opportunity. Many of the early Fellows in Surgery, including myself, are beholden to him for the advantages which we enjoyed. It is fitting that we should hear from Dr. Strachauer.

ARTHUR C. STRACHAUER, M.D.
Minneapolis, Minnesota

Dr. Wangensteen, honored guests, and fellow colleagues:

It is a great pleasure to participate in this occasion. Dr. Colvin was one of my teachers. He was held in very high esteem by the student body. I very well recall his clinics at the Ancker and St. Luke's Hospitals. They were very carefully prepared and conducted as though for an important scientific body. Groups of patients illustrating various phases of a condition, x-ray plates, and pathological specimens would somehow be gotten together. I can see Dr. Colvin in my memory now with the articulated bones of an extremity in his hands, carefully going over the subject for presentation. His teaching had mostly to do with the surgery of the extremities and conditions of vital importance to general practitioners. He was a sound practical teacher and absolutely devoid of the quality of show-off. To this day I have never seen him operate, but he did succeed in teaching and stimulating his students. He has given a life-long devotion to the welfare of medical teaching, and incidentally to the welfare of the Ancker Hospital. It is my understanding that he installed the first x-ray equipment in that hospital and that he fathered and mothered and operated the same for many years.

Doctor Ritchie was likewise one of my teachers. I first saw him in the operating rooms of the St. Luke's Hospital participating in the clinics conducted by that grand gentleman and surgeon, Dr. Archibald MacLaren. When the Elliot Hospital, that is, the first unit of the University Hospital, opened the surgical staff consisted of Dr. James E. Moore, Chief, Drs. MacLaren and Arthur Law, assistant chiefs, Doctor Ritchie, Earl Hare, Warren Dennis and myself as associates. I, therefore, had the opportunity to meet Dr. Ritchie professionally and intimately a number of times every week over a period of years. I am glad I had the opportunity to know and appreciate his sterling worth. I think of Doctor Ritchie as an able surgeon and successful teacher. He has always been particularly interested in helping the younger men in surgery. Over all these years, and with plenty of opportunities obtaining, I have never known Dr. Ritchie to speak an unkind, uncomplimentary or slighting word regarding any fellow colleague. Incidentally, he has earned national recognition in plastic surgery and the love of his fellow men.

Doctor Corbett has always been the typical scientist. His approach to surgery was, therefore, naturally the scientific one. He has always been fussing with collections of something. When I first knew him he was collecting and growing bacteria in the capacity of city bacteriologist in Minneapolis. He was also working very hard on a big pipe at that time, and I know from first hand information that he is still working on it. Doctor Corbett organized and conducted the first respectable laboratory for surgical research that we had at the University. You all know how devotedly and successfully he labored in that field. He also had a surgical service at the University Hospital over a period of years, at the same time I was similarly occupied. Doctor Corbett has always wanted to know the whys and wherefores. He has been an outstanding inspiration to the student body. Doctor Corbett has, as long as I have known him, been a great collector. His office is a veritable museum. He has collected all sorts of things—minerals, fossils, pathological specimens, and what-not. His collection of Thompsonites and North Shore Agates is one of the most complete in existence. During the years that he has been engaged in private practice, he has been collecting gall bladders, kidney stones, brain tumors, friends and fees and every sort of specimen he could get.

We owe much to the teachings and inspiration of these three teachers. I wish them all health and happiness and a continuance of their usefulness.

Dr. Wangensteen

ABOUT fifty years ago, two brothers trained in the art and science of surgery in Switzerland, came to the Twin Cities. Their influence upon the practice of surgery in this community has been real. One of them, Dr. Arnold Schwyzer, is here tonight. He was identified with the Department of Surgery for a number of years as Professorial Lecturer and became an emeritus member of the department a few years ago. Everyone admires and respects him for his profound knowledge and his scholarship, as well as for his unusual ability as a surgeon. I hope that Doctor Schwyzer will be good enough to say something on this occasion.

ARNOLD SCHWYZER, M.D.
Saint Paul, Minnesota

On hearing the addresses of our three guests of honor I am particularly impressed by the fact that they —every one of them—spoke practically only of others, their teachers, their friends, their colleagues. This modesty is almost going too far. We came here to celebrate *them* for what *they* did and accomplished. When I came to Saint Paul in 1891 there were very fine men here at the head of our medical profession,

but the university was still anything but a finished school. Much, very much labor was needed to make it a real school. Sure enough a good beginning was made and men like Jim Dunn of Minneapolis and Charles Wheaton of St. Paul were towering men and great surgeons of splendid surgical attainments and keen intellects. But so much was still needed, especially in pathology, microscopy, experimental work, refinement of diagnosis, etc. And this was undertaken and accomplished by the generation of our honored guests. They put heart and soul into their work and these are not words of oratory. Just look at the results. Look at the rows of our teachers, recognized far and wide. With that generation our university got on the map. And look at the wonderful buildings all around us. We have mighty good reason to be proud of all this development.

The three gentlemen whom we are here to honor, worked for many, many years on this development. Here next to me sits Doctor Corbett. His keen and clear eye, speaking of wisdom and understanding, his kindly smile revealing a heart made for friendship, his interest and inquiry into many fields outside the professional studies, . . . well, you have just heard of a present of appreciation which his university friends gave him. Why? Because besides recognizing his professional abilities and accomplishments they just simply love that man. But let me tell you, if his Saint Paul friends were to pile up their love for him I know that pile would not be shorter than the one of his home town.

And here in the middle of the head table sits my old friend, Harry Ritchie. His father in my earliest days in Saint Paul was very kind to me. He was an outstanding member of what we call the old guard who gave Saint Paul the splendid reputation of professional harmony of which I had heard in Indianapolis before I ever reached Saint Paul. Dr. Harry is so infernally modest that I know he would rather have me talk about his father than about himself. You all know he is the personification of modesty. It looks inconceivable that he could have an enemy. So one is helpless, one just has to love him. You all know what he has accomplished in some special fields. For fear of making him uncomfortable I will only say, if I had a brother or a sister across the ocean who had a child with a cleft palate, I should try to have them come over here.

Then finally over there is Doctor Colvin. Here I am in a ticklish position. If I said too many nice things about him no matter how well to the point, he might even get sore. Well, we have been riding on horseback together weekly for over thirty years, summer or midwinter. On these long rides we discussed just about everything. Regularly our experience of the past week was gone through. We talked of interesting cases and dissected failures. General human problems came up and also medical men were sized up. One thing we always agreed upon was that besides knowledge, experience and technique it was of utmost importance that the surgeon have character, character to guide him earnestly and honestly in his dealing with patients. My life—let me say no more—has most decidedly been richer through this association.

So here we have three men with us tonight of whom the university and we of the surgical group in particular have good reason to be proud. They put their shoulders to the wheel when the university was in its adolescence. And the result is that we can look with confidence into the future. Not only this! We are very proud of our school of today as we see it leap into the lead of schools. Doctor Wangensteen and his co-workers merit our heartfelt thanks. One of my sons, as a lowly intern, learned more in one short year than I thought feasible, and they learn to work and work hard. If we were across the water, and had, as is the habit over there, some beer in front of us, I should lift my mug high into the air and shout a hurrah for our university and our medical school.

Dr. Wangensteen

IT would not be appropriate to conclude this meeting without a word from our Dean, Dr. H. S. Diehl. The Medical School, under his leadership, has forged ahead. He has gained the complete confidence of everyone connected with the Medical School and the feeling of *espirit de corps* was never better in the school than now. Everyone who knows Dr. Diehl feels sincerely that under his guidance the Medical School will grow and prosper.

This has been a happy occasion. I am certain that I bespeak the cordial sentiment of the members of the Department in congratulating Doctors Colvin, Corbett and Ritchie on their many years of faithful and loyal services to the Department, the Medical School and the university—years rich in accomplishment. My colleagues, I know, join me in the hope that you may live long to continue the work you love so well, and to enjoy the esteem and admiration of your colleagues and friends. I shall now ask Doctor Diehl to adjourn the meeting.

HAROLD S. DIEHL, M.D.
Minneapolis, Minnesota

Honored Guests and Colleagues:

I consider it a great honor and privilege to represent the Medical School upon this occasion which marks the passing of a significant milestone in the history of the Department of Surgery. Our distinguished guests have in their remarks and reminiscences given us a picture of the development of the Department of Surgery from its very beginning up to the present time. They have recalled from the past to parade in review before us the master surgeons and distinguished teachers who laid the foundations for the splendid Department of Surgery of which our Medical School is so justifiably proud. You will note they said but little about physical facilities, realizing that it is primarily personalities and spirit that make an institution outstanding.

In truly characteristic fashion also each one of our guests has told his story as though he himself were a spectator and not a major contributor to the building of this Department and this Medical School. From my own personal contacts with this school, which from student days to the present time have already covered

twenty-seven years, I can vouch for the fact that Dr. Colvin, Dr. Corbett, and Dr. Ritchie have played major rôles in the life of this institution and have written their names indelibly into its history.

As to the present status of this department to which these men have devoted a major portion of their professional lives, I have no hesitancy in saying that it ranks well with departments of surgery anywhere. In spite of a relatively meager budget, a small salaried staff, and limited facilities for research, this department has been able, due to a splendid spirit and a loyal and competent staff, both full time and part time, to carry on not only a sound teaching program in surgery at both the undergraduate and graduate levels, but also an active program of important original investigation. Dr. Wangensteen and his associates, most of whom were trained by the men whom we are honoring this evening, are conducting a Department of Surgery which is a credit not only to the Medical School but to the University of Minnesota as well. Such a department reflects the vision, the sound judgment, the idealism, and the ability of the men responsible for its development.

Looking toward the future of our Medical School we have every reason to be optimistic. This school is stronger today than ever before in its history and those of us who are responsible for its administration will do everything in our power to carry on the splendid institution which you and your colleagues of the faculty have built. As to the Department of Surgery I am sure that none of us has any misgivings so long as it retains its excellent staff and continues under Dr. Wangensteen's able leadership.

In conclusion, speaking as one of their former students, I want to assure Doctor Colvin, Doctor Corbett and Doctor Ritchie that through their service to the Medical School they have won the respect, gratitude and affection of generation after generation of students. No teacher asks any greater reward. Individually and collectively you gentlemen have rendered all the service that any institution has a right to ask and you have reached the official University age for retirement; yet we still need, and we hope that we may have, your continuing and active interest, support and participation in the affairs of the Medical School and Department of Surgery.

CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

Frank C. Andrus, Pathologist

MYXEDEMA AND CONGESTIVE HEART FAILURE

Presentation of a Case

The case is that of a seventy-seven-year-old white man who was admitted to the Medical Service of the hospital on July 31, 1941. He stated that he had been previously well until about one month prior to admission at which time he first noticed edema of the ankles. Approximately the same time, he noted some swelling of his hands. He had had exertional dyspnea for seventeen years which he attributed to his being so markedly overweight. This had been growing worse prior to admission. He had seen a physician who sent him into the hospital because of the ankle edema. He had seen this same physician about fifteen years previously who had examined him and stated that his heart was normal at that time. Past history revealed that he had had polyarthritis at the age of seven and again at fifty-six years. He had not been forced to bed during either of these attacks.

At the time of admission to the hospital, he was seen to be a well developed and markedly obese white man weighing 215 pounds. He did not appear to be acutely ill. He stated that he had been obese for many years. He showed some impairment in hearing which, upon questioning, revealed that he had had this difficulty for about six years. It was noted that his voice was deep, suggestive of that of a patient suffering from myxedema. Upon direct questioning, he stated that his voice had always been deep as far back as he could remember and that he had noted no special changes recently. His memory was fairly good; he answered questions quickly and intelligently. It was noted that there were purplish-reddish, discolored, sunburned areas on the skin of the hands in a symmetrical distribution resembling the change seen in mild pellagra. There was some puffiness about the eyelids. The skin was pale and had a yellowish color. There were myxedematous areas in the supraclavicular region on both sides. The Achilles reflex was definitely slowed. The skin seemed to be rough and dry. Examination of the chest showed hydrothorax on the left. The heart was slightly enlarged to percussion. A systolic murmur was heard over the base of the heart which was not transmitted to the neck vessels. A diastolic murmur could not be heard. The first sound at the apex and the second sound at the base were very faint. There was no systolic thrill palpable at the base of the heart. The pulse on palpation over the radial artery had a normal quick rise and fall and did not suggest the slow rise and falling pulse of aortic

stenosis. An electrocardiogram showed some lowering of the voltage, negative T_1, and increased P-R conduction time. There was a pitting edema of both ankles. There was no edema of the hands although he stated that his hands had been swollen. There were no xanthomata of the skin. The blood pressure was 128/60. The venous pressure was 12 cm. of citrate solution.

Laboratory Work.—The hemoglobin was 83 per cent with an erythrocyte count of about 4,000,000. The urine contained only a trace of albumin. The plasma proteins were normal. The blood cholesterol was elevated to 357 mg. per cent. The basal metabolic rate was minus 30 per cent.

Course in the Hospital.—The patient was digitalized during a period of forty-eight hours with good response. He had a good diuresis with disappearance of the edema and decrease in the dyspnea. He had lost 13 pounds in weight. A thoracentesis was done and 1000 c.c. of fluid were removed from the left pleural cavity. On the fifth day after admission, August 5, 1941, another basal metabolic rate was taken which was minus thirty-two per cent. Thyroid was not administered at this time. On August 12, 1941, the basal metabolic rate was minus thirty-five per cent. At this time he was given one-half grain of desiccated thyroid extract daily. He was kept on this regime for three days. He felt well during this period on a half grain of thyroid extract. He improved so the dosage was increased to one grain daily. At this time his heart seemed to be very well compensated. Nine days after starting thyroid, the patient became very dyspneic, râles were heard at the lung bases. There was no peripheral edema and the venous pressure was 9 cm. For six or seven days previous to this attack, his urinary output had been dropping and varied between 150 and 350 c.c. daily. His venous pressure had dropped to about 8 cm. before we started thyroid extract. The following day he had several severe attacks of syncopy. During these attacks he became very dyspneic, faint, and weak. The pulse rate was around 60 per minute. He got cyanotic. All medications were stopped immediately at this time. The following day he continued to have severe attacks of syncopy and began having Cheyne-Stokes respirations. The blood pressure was 108/70. The blood urea nitrogen was 16.5 mg. per cent. He was given aminophyllin because of his syncopy, dyspnea, and cyanosis and later papaverine was administered. For the next two days he was entirely free of syncopy and seemed to be improving. However, again fluid was found in his left chest. The venous pressure at this time was 11 cm. A basal metabolic rate was minus one per cent. Digitalis was again started. Over the course of the next two days he seemed to be definitely improving. On August 31, 1941, he was given one grain of thyroid extract. That evening, about twelve hours after the administration of the thyroid, he suddenly expired.

Clinical Diagnosis.—Rheumatic heart disease, myxedema, and myocardial insufficiency.

Autopsy Findings.—Dr. David Fingerman: The body was that of a well developed and markedly obese man weighing about 210 pounds. There was no edema or cyanosis at the time of death. The skin everywhere had a yellowish discoloration. No special external marks were noted. The liver edge extended three centimeters below the costal margin; the capsule was tense and the cut surface showed extreme changes of chronic passive congestion. The left pleural cavity contained about a liter and a half of clear fluid. The right pleural cavity was negative. A fibrous pericarditis was present which obliterated the pericardial sac but the pericardium was not adherent to the surrounding structures.

The heart was greatly enlarged weighing 610 grams. Its transverse diameter was 17 cm. while that of the chest was 29 cm. There was rather marked hypertrophy of the musculature of both ventricles, particularly of the left, which measured over 2 cm. in thickness. The commissures of the aortic valve were fused. The valve leaflets were stiffened and contained calcarious nodules which encroached upon the orifice so that the total lumen was about the size of a lead pencil. The mitral valve leaflets were thickened and the orifice of the mitral valve measured only 7 cm. in circumference. The chorda tendinæ were thickened and shortened so that the valve was also incompetent. The root of the aorta showed a most extreme atherosclerosis. The coronary arteries showed a patchy arteriosclerosis which so encroached upon the lumina that in numerous places in both branches of the left and right coronary artery, only pin-point openings remained. No thrombi, however, were seen. The descending aorta also showed severe atheromatous changes.

The lungs were greatly increased in weight and showed congestion and edema. The remainder of the thoracic and abdominal organs showed no noteworthy changes.

The thyroid gland was greatly reduced in size, only a thing, fibrous, leaf-like remnant remaining. A few small islands of thyroid parenchyma could be seen in the fibrous connective tissue.

Anatomic Diagnosis.—Rheumatic heart disease, aortic stenosis and regurgitation, mitral stenosis and regurgitation, myxedema, coronary sclerosis, and myocardial insufficiency.

Discussion

Dr. Frank Andrus: I believe that this case illustrates the effect of the reduction of minute volume caused by myxedema in valvular heart disease. Here is a patient who had long outlived his life expectancy considering the severe aortic and mitral stenosis that he had. I think there is no question but what the myxedema and the increase of the circulation time was effective in prolonging his life. It seems that the effect of the administration of the thyroid and the lowering of the circulation time to normal in a heart hampered not only by the valvular deformities, but by the extreme coronary sclerosis was to make the heart unable to keep up. Thus the patient again developed anasarca and the attacks of syncopy.

Examination of the thyroid revealed a primary atro-

phy of the gland, the type we most commonly see in primary myxedema.

Although the aortic valve in these cases contains a great deal of calcium and is very sclerotic, we believe that it was caused by the rheumatic fever rather than by arteriosclerosis. The mitral stenosis and regurgitation, of course, is clearly rheumatic in origin and it is reasonable to assume that both valves were involved during the patient's bouts with rheumatic fever. This is the type of rheumatic aortic valvulitis we see in older individuals, particularly in old men.

Dr. Bell: How much desiccated thyroid does a patient having myxedema require?

Dr. Fahr: It takes about one grain to raise the basal metabolic rate ten points. In a case such as we are considering it is unwise to bring the metabolic rate up to the normal because of his cardiac lesions. You want to keep the basal rate up only far enough to get rid of the symptoms of myxedema and at the same time keep the work of the heart as light as possible. This is the basis of the treatment of heart disease with total thyroidectomy. The work of the heart is reduced fifteen or even twenty-five per cent. This patient's symptoms, when he was admitted, were more of myocardial insufficiency than thyroid. However, the man's skin had the appearance one sees in myxedema consistent with the high cholesterin levels, his voice was typical, and he had the chair changes. However, he did not complain of myxedema but only of his heart.

Dr. Mortensbak: I have reviewed some of the recent reports regarding later results in the treatment of heart failure or intractable angina by total ablation of the thyroid. On the average the basal metabolic rate is kept at a level of minus 16 per cent. The circulation rate increases from twenty seconds to thirty-two seconds, and the blood cholesterol goes up to about twice normal. There is no significant change in the size of the heart, the blood pressure, or the vital capacity. Berlin reports twenty-three of 109 patients alive after six years, and Cutler had sixteen of fifty-seven patients alive after five years. Their studies indicate that the response is somewhat better in patients who are being treated for status anginosis. Of the total 166 patients operated upon, seventy-one showed marked improvement, thirty-nine moderate improvement, and the remainder obtained slight or no benefit.

Dr. Bell: Do all of the patients require thyroid after the operation?

Dr. Andrus: They do not seem to require it for some period of time. One of the patients developed clinical myxedema in as short a period as forty-eight days.

Dr. Fahr: A lot depends upon the surgeon getting all of the thyroid gland out. If this is not done the patient may not develop myxedema.

Dr. Peppard: I have observed a woman now sixty-three years old since 1919. There is nothing particularly interesting in the early part of her story. She had her menopause in her late forties. In 1932 her blood pressure was slightly elevated. She had never had any difficulty with her heart. Extra-systoles were observed on occasion. In 1936 she complained of fatigue, dryness and itching of her skin, and of being very forgetful, and while she denied being dizzy, she had frequent spells of unsteadiness. Her B. M. R. was minus 28 per cent. There was no evidence or symptoms of congestive failure. I gave her thyroid extract over a period of about three weeks. She stated that she felt better, stronger, and improved in every way. After about three weeks of treatment her B. M. R. was minus one per cent. The dose of thyroid was diminished, and the rate was held at that level. About two weeks later she presented herself with complaints of palpitation, breathlessness, and swelling of the ankles. We immediately stopped administering the thyroid and gave her digitalis. Subsequently, the edema lessened and disappeared. She got along nicely until after a laparotomy for intestinal obstruction was done due to volvulus the following year when she developed the symptoms and electrocardiographic findings of coronary thrombosis. We have administered enough thyroid to keep her basal metabolic rate at minus 15 per cent. It seems that with this patient also the myxedema was protecting her and when we took away her protection, she developed congestive heart failure. I have had some experience with treatment of heart disease by total thyroidectomy. From the reports available, the operative mortality is about 10 per cent higher in the congestive series. Really good results were obtained in approximately one-third of the cases. In the angina group the operative mortality was 4 per cent and excellent results were seen in 55 per cent. Most of the cases were operated in 1933 and 1934. The treatment was taken up with considerable enthusiasm which has since waned.

Dr. Bell: Does anyone do the operation now?

Dr. Fahr: We do, in selected cases. We have never had an operative death. In one patient, though he had had continual angina pectoris, he obtained relief for six years. Now his angina is coming back. We have another patient, a truck driver, who was bedridden for a long time because of decompensation due to aortic regurgitation. After his thyroidectomy he became compensated and has been back on his job for six years. It is of utmost importance to maintain the metabolic rate at the proper level after the operation.

CARCINOMA OF THE STOMACH WITH PARTICULAR REFERENCE TO DIAGNOSIS AND RESULTS

The only hope for cure of gastric cancer resides in recognition of the disease at a sufficiently early stage to permit its surgical removal. The means whereby this disease can be recognized, at this stage, when the opportunity is presented, are within the means of us all, namely, a carefully taken history, a clear appreciation of the symptoms which may be produced by early cancer in the stomach, and insistence on competent roentgenologic diagnosis of the stomach in any case in which gastric cancer is even faintly suspected. In addition, an accurate differential diagnosis of any gastric lesion which either may be or might become carcinomatous is essential. The benefit of exploratory laparotomy should be given to any patient who has gastric cancer, when there is even a small chance that the lesion might be removed, unless obvious metastasis already is present. Approximately one-third of the patients who have gastric resection performed for carcinoma of the stomach and survive the operation will live for five or more years following removal of the growth. Although the ultimate prognosis of gastric carcinoma is not bright, by increasing effort and diligence on the part of the medical profession it is hoped that end results gradually may be improved.—James T. Priestley, M.D., Rochester, Minn. [Jour. M.S.M.S., 40:867, (November) 1941].

CASE REPORT

SALMONELLA PANAMA INFECTION

Report of a Case in Minnesota

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The occurrence of *Salmonella panama* in Minnesota extends the reported geographical incidence of this organism. It was first isolated by E. O. Jordan during a study of an outbreak of food poisoning among American soldiers in Panama. Kauffmann[4] identified it serologically as a new species. Schiff[5,6] and Bornstein[1] reported fifteen isolations from sixteen cases in the New York City area. Of these, seven cases were described as to clinical history and outcome. Five were infants and one was an eleven-year-old boy suffering from osteomyelitis from whose blood the organism was isolated. The remaining case was that of an adult with a "granulomatous lesion of the intestine. It cannot be decided whether the infection caused any symptoms in this patient." Hormaeche[3] isolated the species from an infant in Uruguay. These are the only published reports, although Edwards[2] has identified a number of as yet unpublished isolations. The present case is of interest because it is the first described in this part of the country and because it is the first reported fatal case in an adult.

The patient, a seventy-four-year-old woman, was admitted to the hospital in a comatose condition. As far as could be determined, she had never been ill until the present, although she had complained of back pain during the past year. One week prior to admission, the patient developed abdominal pain which was accompanied by a profuse diarrhea. The diarrhea and abdominal pain lasted for four days, during which time the patient was ambulatory and considered herself quite well. At this point she began to complain of back pain, and before entering the hospital became stuporous, developing labored respiration, The family doctor stated that for two days prior to admission, she had a marked oliguria despite adequate parenteral administration of fluids.

At the time of admission the temperature was 98.6° The pulse was full and slow. Examination of the abdomen was negative. The leukocyte count was 33,300 with 92 per cent polymorphonuclear cells. Blood urea nitrogen was 102 mgm. per cent, the carbon dioxide combining power was 13.6 vols. per cent, and the blood sugar was 176 mgm. per cent. After cystoscopy, a diagnosis of prerenal uremia and acidosis, secondary to the diarrhea, was made.

Blood, urine, and stool cultures on the day of admission yielded, in each case, a Gram-negative rod which gave atypical agglutination with the paratyphoid B antiserum, and which gave biochemical reactions characteristic of the genus Salmonella. This organism was later identified by Dr. P. R. Edwards of the University of Kentucky, by means of the Kauffmann technique, as *Salmonella panama.*

The patient grew progressively worse, the temperature rising to 104° on the day following admission. At this time x-ray examination revealed evidence of a bronchopneumonia. The patient expired twenty-four hours after entering the hospital.

Autopsy revealed a bronchopneumonia, and bilateral small granular kidneys, weighing 50 and 75 grams. No lesions were present in either the small or the large intestine. The final diagnosis was Salmonella infection complicated by a chronic pyelonephritis. The immediate cause of death was uremia.

The Division of Preventable Diseases of the Minnesota State Board of Health, in checking the epidemiology of the case, isolated the same organism from stool cultures of the patient's husband. However, he gave no history of gastro-intestinal disturbance.

More frequent identification of unusual species of Salmonella in man will undoubtedly follow the wider recognition and use of the Salmonella centers set up in various parts of the country for the identification of members of this genus. The correct identification of such strains is essential for a better understanding of the epidemiology and clinical course of Salmonella infections.

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HOMEOPATHIC AND ECLECTIC MEDICINE IN MINNESOTA*

By James Eckman

Rochester, Minnesota

(Continued from October issue)

Certain Homeopathic and Eclectic Pioneers

Dr. James Grant Gilchrist (1842-1906) was born on April 28, 1842, in New York City.[117] It has been said that he settled in Winona in about 1860,[118] but W. K. Kratz,[117] assistant registrar of the Hahnemann Medical College of Philadelphia, reported that Gilchrist was not graduated from the Hahnemann Medical College until 1863. If he was in Winona in 1860, he did not at that time have the degree of Doctor of Medicine. In 1866 Dr. Gilchrist had an office in Winona on Third Street,[118] and in 1871 he became a member of the Minnesota State Homœopathic Institute. He also had an important part in the foundation of the Southern Minnesota Homœopathic Medical Society at Owatonna in October, 1871, and he became that society's first secretary and treasurer.[6] It was said that Dr. Gilchrist was the first homeopathic physician to settle in Owatonna,[6] to which city he removed from Winona. He went to Detroit, Michigan, in 1872. At his death on March 22, 1906, at Iowa City, Dr. Gilchrist was professor of surgery in the old State University of Iowa College of Homœopathic Medicine,[119] which was abolished in 1919.

At Owatonna Dr. Gilchrist was succeeded in February of 1872 by **Dr. Daniel H. Roberts**[6] (1824-1910), an influential Southern Minnesota practitioner who was elected second vice president of the Minnesota State Homœopathic Institute in 1875, first vice president in 1876, and president in 1877. He will be considered later.

It has been shown that **Dr. Oscar Trenkler** (1829-1892) settled in Winona in July of 1861, and that he operated "O. Trenkler and Company" with Dr. A. Putsch over the bank of Orrin Smith and Company in Winona.[120] On December 18, 1862, according to the Adjutant-General's Office of the War Department,[121] Dr. Trenkler entered the United States Army as assistant surgeon to the Fifteenth Wisconsin Infantry Regiment. He was honorably discharged from the army on June 1, 1863, by reason of acceptance of his resignation.[121] In his letter of resignation to the War Department he stated that he desired to settle certain business matters in Germany, his homeland, and that his mother, who was living in that country, wished to see him.[121] It would appear that Dr. Trenkler thereupon went to Germany, for he did not return to Winona until August of 1866.[120]

In 1872, according to Neill,[122] Dr. Trenkler moved to Mankato. He was licensed to practice medicine in Minnesota on December 28, 1883.[83] While

he was in Minnesota he was a member of the Minnesota State Homœopathic Institute. In March of 1888 the *Minnesota Medical Monthly*[123] announced that Dr. Trenkler had decided to go to Carthage, Missouri, and the Division of Medical Licensure of the Missouri State Board of Health has reported that Dr. Trenkler was licensed to practice medicine in that state on August 10, 1888.[124] He received License No. 3604. At the time of his licensure he said that he had been graduated from Ludwigs-Universität Medizinische Fakultät of Giessen, in Hesse, Germany, on February 4, 1854. Mr. C. B. Taylor,[125] of the office of the clerk of Jasper County, Missouri, advised that the Knell Mortuary of Carthage, Missouri, told him that Dr. Trenkler had left Carthage to return to Germany at an uncertain date, but this information would appear to be incorrect, because Mr. P. M. Hamer,[126] chief of the Division of Reference of the National Archives in Washington, D. C., reported that Dr. Trenkler died in Carthage on September 16, 1892, and that his death was attested to by Dr. Frank W. Flower (1838-1915) of Carthage, in an affidavit made to the Pension Bureau on September 21, 1892.

Dr. Paul G. Denninger (1848-1927) was born in Berlin, Germany, on January 20, 1848. In 1862 he came to the United States with his parents, and in 1871 he settled in Minnesota, presumably at Eyota, although in 1881 he was in Faribault. He was elected to membership in the Southern Minnesota Homœopathic Medical Society in October, 1871,[6] but did not receive the degree of Doctor of Medicine until 1879, when he was graduated from the Hahnemann Medical College and Hospital of Chicago. Dr. Denninger was licensed to practice medicine in Minnesota on April 22, 1884.[83] He became a member of the Minnesota State Homœopathic Institute and for some years practiced in Faribault. In about 1890 he removed to California. He practiced in various California towns, and died in San Jose on December 10, 1927.

The name of **Dr. Edmund Beckwith** (1836-1915) is one which evokes much speculation. He was born at Nelson, Ohio, on October 14, 1836, and was graduated from the old Homœopathic Hospital College of Cleveland in 1865. He came to Minnesota a short while thereafter. He became a member of the Southern Minnesota Homœopathic Medical Society at its foundation in Owatonna in 1871, and at that time was living in Rochester.[6] He was never licensed to practice in Minnesota.[83] Dr. Beckwith went to California, probably before 1883, and lived there for most of his life. When he died on September 21, 1915, at Petaluma, California, he was referred to as a pioneer practitioner of the town.[127] It will be noticed that Dr. Beckwith was graduated from a homeopathic institution in Cleveland, and therein arises the speculation previously mentioned. Dr. Seth R. Beckwith (1832-1905), a native Ohioan, was professor of surgery in Edmund Beckwith's college before 1870, was one of the founders of the Pulte Medical College of Cincinnati,[10] and was said to have been the personal physician of James A. Garfield.[128] He died on January 20, 1905.[128] Dr. David H. Beckwith (1825-1909) was professor of sanitary science in Edmund Beckwith's college,[9] president of the Cleveland and Ohio boards of health, and vice president of the Cleveland Medical Library Association.[129] He died in Cleveland on November 19, 1909.[129] If Seth and David Beckwith were related to Edmund Beckwith, as seems likely, the Minnesota pioneer would appear to have come from distinguished background in homeopathic circles in Ohio.

Eden Prairie, Excelsior and Shakopee were the locations, in the order named, of **D. S. French** (1812-1867), who never obtained the degree of Doctor of Medicine.[91] He settled in Eden Prairie in 1855, went to Excelsior a few years later, and in 1861 removed to Shakopee. One of the founders of the Minnesota State Homœopathic Institute in 1867, French died in that year before he could complete his course of lectures at the Hahnemann Medical College of Chicago.[91]

At Winona **Dr. Henry N. Avery** established himself in homeopathic practice in July, 1873, thirteen years after Dr. J. G. Gilchrist had located there. He came from New York City, where he had been professor of physiology and clinical lecturer in diseases of the throat and lungs in the Homœopathic Medical College of New York City.[130] He was a member of the New York State Board of Medical Censors at the time he ventured to Minnesota, and was said to have brought with him the recommendation of Theodore W. Dwight (1822-1892), professor of municipal law at Columbia University and later head of the law school at that university, and Roscoe Conkling (1829-1888), United States Senator from New York.[130] Dr. Avery went to Galesburg, Illinois, in 1877, and settled in Minneapolis in 1882.[130] He became health commissioner of the city of Minneapolis in 1895, and occupied that office until his sudden death at Forman, North Dakota, in 1898.[76]

Dr. Chester Goss Higbee (1835-1908) was born in Pike, New York, in 1835, and at an undetermined date moved to the state of Wisconsin. He volunteered for military service during the War of the Rebellion, enlisting as a private in the Twelfth Wisconsin Infantry Regiment, and emerging with the rank of captain of volunteers. He is known to have been living in Red Wing in February of 1867, but was not at that time a Doctor of Medicine.[77] He read medicine with Dr. T. J. Patchen of Fond du Lac, Wisconsin, and in 1870 was graduated from the Hahnemann Medical College and Hospital of Chicago. Dr. Higbee came at once to Red Wing, where he practiced until 1873 or 1874, at which time he settled in Saint Paul. He was active in organizing the Ramsey County Homœopathic Medical Society, and was a member of that body's first board of censors.[32] In 1878 he was elected to the presidency of the Minnesota State Homœopathic Institute, and in 1890 he became vice president of the American Institute of Homœopathy. He died in Saint Paul on April 3, 1908.[131]

Dr. Jacob M. Saunders (1816-1904) was born in New York on April 11, 1816, the son of August Saunders.[107] He came to Minnesota in 1870 from Madison County, New York, and he was graduated from the Hahnemann Medical College and Hospital in 1871. He became a charter member of the Southern Minnesota Homœopathic Medical Society in the same year.[6] At that time he was living in Dodge Center, and there is reason to believe that he remained in or near Dodge Center for most of his life, although in 1884 he was at Mantorville. He was licensed to practice medicine in Minnesota on December 28, 1883.[107] Dr. Saunders died of paralysis in Ashland Township, Dodge County, on January 14, 1904. He was buried in Milton, Rock County, Wisconsin. He became a member of the Minnesota State Homœopathic Institute in 1871, and was elected second vice president of that body in 1877 and first vice president in 1879.

In Marshall **Dr. Stewart V. Groesbeck** (1841-1908) entered into practice in about 1872. He was born in Otselic in Chenango County, New York, on September 23, 1841, and at the age of seven years journeyed to Wisconsin with his parents.[132] He studied medicine for a while before he enlisted in Company F of the Eighth Wisconsin Infantry regiment on September 23, 1861, for service in the War of the Rebellion. Wounded twice in that war, he was discharged from the Army in November of 1864, and returned to Wisconsin. It is not known that Dr. Groesbeck was a graduate of a medical college. He was a member of the old Minnesota State Eclectic Medical Society, founded on May 26, 1869, at Owatonna,[48] and he may have been a member of the Southern Minnesota Eclectic Medical Society, established on November 14, 1869. Neill[132] said that Dr. Groesbeck was issued a license to practice medicine in Minnesota in 1871, a statement which may mean that he was affected by the Medical Practice Act which became law on March 4, 1869, and was repealed at a later session.[3] In Marshall Dr. Groesbeck was a citizen of some importance. When in November, 1874, Delta Lodge No. 119 of the Masons was organized at Marshall, he was elected junior warden, and he served as postmaster of Marshall, president of the Marshall Board of Health, and register of deeds and coroner of Lyon County. Records[63] indicate that in 1887 he was living in Watertown, Codington County, Territory of Dakota. On June 11, 1887, he underwent an examination for a license to practice medicine in Dakota Territory, and on June 23, 1887, the license was issued to him.[63] By 1906 he was living in Spearfish, South Dakota. He became surgeon to the National Home for Disabled Volunteer Soldiers at Hot Springs, South Dakota, and died in that institution on December 31, 1908.[133] At his death he was a member of the American Medical Association.[133]

Dr. Theodore L. Hatch (1848-1913) of Owatonna was an eclectic physician who made the change to orthodox practice gracefully and without difficulty. He was born in Broome County, New York, on January 20, 1848, and was educated at a common school. At the age of about twenty years he began to teach school, studying medicine meanwhile at Neillsville, Wisconsin, under a preceptor. He was graduated in medicine from the University of Michigan on March 29, 1871, and in October of that year came to Steele County in Minnesota, where he settled first at Blooming Prairie and later at Owatonna.[134] He was secretary of the old Minnesota State Eclectic Medical Society in 1881, and was re-elected to that post at the meeting of the society in Minneapolis on May 24, 1882.[135] In 1881 he wrote that the society had twenty members, and remarked that "When we realize that in our state Eclecticism has barely a foothold, while our school is fully represented in our adjacent sister states, it cannot be considered a favorable reflection upon the Eclectic Medical fraternity of Minnesota, and should be a stimulus to each of us to make a greater effort for the advancement of our system of Medicine."[136]

Nevertheless, Dr. Hatch became a member of the Steele County Medical Society, the Southern Minnesota Medical Association, of which he was once president,[134] the Minnesota State Medical Association and the American Medical Association. He also served as president of the Owatonna board of health. At his death on March 12, 1913, it was written: "Dr. Hatch would have carved for himself a niche in the history of medicine in the state of Minnesota, but poor health had worked against him so much that he gladly welcomed the end."[134]

Dr. Alvinza B. Cole (1848-1924) was born in Canton, New York, on December 28, 1848. In 1878 he was graduated from the old New York Homœopathic Medical College, and shortly after that year he came west to Minnesota. Dr. Cole apparently was a physician who combined both medicine and politics with success, for he was twice elected mayor of Fergus Falls, the city in which he settled, and he was elected to the Minnesota State Senate for the terms 1895-1897 and 1903-1905. At his death in Fergus Falls on June 8, 1924, Dr. Cole was a member of the Minnesota State Medical Association, and was said to have been in the thick of another contest for a seat in the Minnesota Legislature.[137]

Dr. Sidney R. Wakefield (1822-1916) was born in Trumbull County, Ohio, on April 18, 1822, and was graduated from the old Willoughby Medical College of Ohio in 1846. In 1866 he came west to Minnesota, where he settled at Monticello. He had previously served as assistant surgeon to the Seventy-first Ohio Infantry Regiment during the War of the Rebellion. Dr. Wakefield was one of the founders of the Minnesota State Homœopathic Institute at Saint Paul in 1867,[6] and after a lifetime of active service in the practice of medicine, he died of "senile debility" at the home of his son in Creswell, Oregon, on December 13, 1916. He was almost ninety-five years old at death.

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*References 1-18 appear in the June issue, page 479; 19-37 in the July issue, page 572; 38-58 in the August issue, page 674; 59-81 in the September issue, page 769; 82-116 in the October issue, page 873.

(To be continued in the December issue.)

President's Letter

IDEAL CONTINUATION STUDY

THE practice of medicine is a progressive science in every sense of the word and the man who is satisfied with himself and his accomplishment soon finds he is lost in the maze of knowledge and learning that has passed around and by him. Then when put to the test he is found wanting and finds himself bogged down in the forgotten learning of the past.

As one goes about our state and adjoining states, one finds that those men who are the most successful in their various communities are those who always find time to attend medical meetings, who are so interested in medicine that they take the time to do postgraduate work and, in every way possible, keep up with the newer things in medicine and surgery.

The public quickly senses this and comes to know that the man who takes advantage of opportunities for more up-to-date learning is the man to be depended upon. They expect their dollar to buy them the best in service as in other commodities.

Medical magazines give us new scientific facts. Medical books give us detailed procedures in medicine and surgery. But attendance on Continuation Center programs give us not only facts and procedures but direct contact with them that no amount of reading can do.

We have at our University of Minnesota throughout the year, Continuation Center programs of interest to both the general practitioner and the specialist alike, such as are not given any other place in this country; where a few days are so filled with knowledge on one particular subject that the physician student is more than well repaid for the time spent there.

It is my hope that these excellent programs may be continued and that more and more of our members will avail themselves of this golden opportunity for postgraduate work, close to home and under ideal surroundings.

B. J. Branton, M.D., *President*

Minnesota State Medical Association.

EDITORIAL

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BUSINESS MANAGER
J. R. BRUCE

Volume 24 NOVEMBER, 1941 Number 11

POLIOMYELITIS IN 1941

WE have again experienced an epidemic of poliomyelitis in Minnesota. Fortunately, not a great number of victims were claimed this year by this disease which strikes terror into the minds of both victims and parents, particularly because of the uncertainty of the nature and extent of the sequelæ in any certain case.

Up to and including October 21 some 238 cases had been reported in Minnesota this year with fifteen deaths. Last year there were about 256 cases with twenty-six fatalities. The number of cases reported by months shows the disease to be a summer and early fall affliction. Some fifteen cases were reported in the state from January 1 to July 1 this year. Fourteen additional cases were reported in July, seventy-three in August, ninety-five in September and forty-one in the first three weeks of October. Fortunately, the epidemic recedes each year with the appearance of frost.

This year Saint Paul furnished more than her share, eighty-nine cases having been reported from Saint Paul since July 1, compared with fifty-five from Minneapolis and thirteen from Duluth. The remaining cases occurred in some twenty-nine different counties of the state.

While there is some evidence, as shown by the investigation of Dr. Perkins, which is reported elsewhere in this issue, that poliomyelitis is a contact disease, the fact that it awaits the closing of schools before it appears in epidemic form and recedes in incidence after the opening of schools in the fall, shows that there are factors in the spread of the disease that we do not understand.

NON-DEFENSE EXPENDITURES

THE physician in his education does not major in economics or government. Yet, every physician knows and fears inflation and its sequelæ. He knows his expenditures must be kept within his income and borrowing ability, or bankruptcy will follow. He knows, too, that the same rules apply to the Federal Government, and that too great a national borrowing will be followed by inflation and its consequences.

To meet the national emergency incident to the depression and unemployment following 1929, our government greatly increased its spending and simultaneously its taxation and borrowing. Some of the spending was without doubt necessary and justified by the emergency. Unfortunately, with the emergency passed there was no reduction in spending and we meet this present emergency with a huge national debt. The present emergency necessitates even greater spending, taxation and borrowing. Is there any

need for continuing the expenditures necessitated by unemployment?

On May 15 last, Mr. Benson, president of Harding College, located in Nebraska, a college few in this part of the country ever heard of, appeared before the Ways and Means Committee of the national House of Representatives, and made a clear presentation of the danger threatening through the mounting national debt, of inflation and its two common sequelæ, socialism and dictatorship, and pointed out specifically how federal expense of non-defense nature can be cut two billion dollars a year. So statesmanlike was Mr. Benson's presentation that the committee applauded—an unheard response to the presentation of testimony before a congressional committee. So far as we know, this is about all Mr. Benson accomplished.

The citizens of this free land are engaged in a gigantic national undertaking to provide for the defense of our freedom. The medical profession is doing its share, in large part gratis, and will not be too critical of poor planning in high places in this emergency. As taxpayers and patriotic citizens, however, we protest at the lack of horse sense on the part of our representatives in their failure to eliminate, or at least greatly reduce, these non-defense government expenditures, which were emergency measures during the depression and unemployment, but which are no longer justified.

There is some evidence that public opinion on this vital matter is being aroused. Congress should not wait for public opinion before adopting this much needed economy. These government expenditures should have been reduced long ago synchronously with the initiation of the draft program. Mr. Benson has told Congress how the government can reduce its expenditures two billion dollars a year.

SALUTE TO NORWAY*

One ponders at times the fate of the medical profession in the occupied countries of Europe. Out of the dark agony that seems to envelop France, Belgium, Holland, Norway, Poland, and the rest comes no word, no picture of what is happening to the members of the medical profession or any inkling of how they are meeting the ordeal of their captivity, their sojourn in the house of bondage.

The newspaper *PM* for September 25, 1941, carried a special article by Albert Deutsch† which permits a brief glimpse of the Norwegian medical profession under circumstances of great difficulty. From this we quote:

Several years ago the eminent Norwegian psychiatrist, Dr. Johann Scharfenberg, wrote a scholarly paper on the personality of Adolf Hitler, concluding that the Fuehrer was a madman. Soon after the Nazis occupied Norway, Gestapo agents entered Dr. Scharfenberg's home and asked him point-blank if he still held the same opinion.

"My opinion has changed in one respect," Dr. Scharfenberg replied. "When I wrote my article I believed Hitler was insane. Now I *know* it."

"Don't you realize your remark is highly dangerous?" asked the Gestapo men.

"Of course," he replied. "But I am an old man, you see. My work is about finished. Now you can do what you like with me. It doesn't matter."

The Nazis spluttered that Dr. Scharfenberg would have to report at the local Quisling police station each day.

"Too much trouble," said the grand old man. "Here's my phone number. You can call me daily if you wish."

They threw Dr. Scharfenberg into prison. Every day the good people of Oslo sent many baskets of flowers and food to his cell. It all got too embarrassing for the Quislings, who released the old psychiatrist after six weeks.

PM's staff writer says that he obtained his information by piecing together reports from abroad and from firsthand accounts from recently arrived medical refugees from Norway.

The Dikemark Insane Asylum, near Oslo, is the largest institution of its kind in Norway. Last spring its medical director, Dr. Rolv Gjessing, received a notice from the new Nazi surgeon general, Dr. Ostrem, ordering him to promote a certain orderly to superintendent of male nurses. Dr. Gjessing refused, knowing that the man's only qualification for the job was being a loyal Nazi. After repeated threats failed, the Quisling administration dismissed and imprisoned Dr. Gjessing.

This outrage was followed by one of the most remarkable acts in medical history. The heads of all medical institutions in Oslo signed a manifesto to the Quisling regime declaring their opposition to appointments made on the basis of political allegiance, demanding the immediate release and reinstatement of their colleague, and threatening a strike of the entire medical body of Oslo—more than 2,000 strong—unless their demands were granted.

The Nazis threatened to throw every signer into a concentration camp, but the medical ranks held and in a few weeks Dr. Gjessing was reinstated as director of Dikemark.

The Norwegian medical profession has repeatedly joined with organized labor and other groups in bold protests against Nazi tyranny. One such protest, addressed to the Nazi Reichscommissar, Josef Terboven, denounced the brutality of Storm Troopers and mass imprisonments of Norwegian democrats. It was signed by forty-three organizations, representing all sections of the people, including the Norwegian Medical Association and the national societies of nurses, dentists, and pharmacists.

*From an Editorial in *New York State Journal of Medicine*, 41:2103, (Nov. 1) 1941.

†Norwegian Doctors "Refuse to Swallow Nazi Medicine." Excerpts from the newspaper *PM*, Inc. Reprinted by special permission.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

PREPAYMENT PLANS FOR MEDICAL SERVICE

Prepayment plans for medical service fall into three groups at the present time: (1) policies issued by insurance companies which provide cash payment to cover costs of certain types of surgery or medical treatment; (2) limited panel systems in which a closed group of physicians renders more or less complete medical service on a prepayment basis; (3) county or state medical society plans for medical service on a monthly prepayment basis.

There are marked differences between complete medical service and group hospital service and also between medical service, as such, and cash payments to cover or partially cover the cost of medical service.

Hospital Service Is Tangible

Hospital service on a prepayment basis has had a remarkable growth. It is a coöperative effort on the part of hospitals banded together to bring the services of their institutions to the public on a prepayment plan. Actuarial studies govern the amount of service thus made available and the premium to be paid for it. There have had to be many adjustments and corrections since the inception of the plan; but the problem of insuring against hospital costs is much simpler than the problem of insuring against medical fees because hospital service in general is a tangible service and can be measured in terms of standard costs per day.

In the case of cash payments by insurance companies, amounts are strictly limited and payment is under the surveillance of claim agents. Also there are provisions for cancellations of policies. Of course the policies are set up, as far as possible, on a basis of actuarial experience and studies.

Limited Panel Has Checks

In the system where one doctor, or a group of doctors, enters into a contract with patients to render certain stipulated medical services, there are natural economic balances and checks. The patient knows definitely what he may expect under the contract and the doctor knows, with equal definiteness, the limitations in funds with which he has to work. Such panel systems are limited in number; they are not all embracing as to service and they are usually kept under economic control.

In this résumé, however, we are limiting our discussion to plans put into effect in various parts of the country by units of organized medicine. In these plans, all of the qualified members of the medical society associate themselves coöperatively with free choice of physician for the patient to provide the service.

Two methods have been used. One is a definite indemnity insurance plan in which a limited sum of money covering a limited medical service is given to the patient in exchange for a monthly payment. It is necessary to qualify under the insurance laws for this type of plan. Much more frequently, medical society plans are written only in terms of complete or limited medical service, to be given at the discretion of the physician, at a standard schedule of fees drawn up by the physicians and under complete control of the physicians.

Basis Is Coöperative

In contrast to the cash payment plans of insurance companies and to the standard payment to hospitals, on a cost per diem basis, made through group hospitalization plans, these medical society plans rest for their success upon the coöperative relationship of the doctors—and doctors, as everybody knows, are definitely individualists. The doctor's word in each case is apt to become final under these plans. Committees can be appointed

to check differences of opinion as to need for treatment, or number of visits required or amount of the fee. Experience has shown, however, that these committees do not work out as well as might be expected and that the doctor's word, in any case, is usually accepted.

Experience has also shown that surgical cases are the most easily handled under any prepayment plan because there are definite, natural checks to the service. Patients are not likely to subject themselves willingly to unnecessary surgery and, if surgery is done in the hospital, there are the usual hospital checks upon the physician to guard against unessential or unwise operations. When allowances are made for medical services, the experience has been that, while a fair fee is agreed upon and stipulated in the beginning, only a percentage of that fee is paid as time goes on.

Patient Difficulties

In a few instances, experimentation is going on with prepayment plans to cover medical service while the patient is in the hospital and with certain added restrictions.

Actuarial studies will in time show something definite about risks and costs of furnishing medical services in the hospital, office and home. In the meantime there are some great difficulties to be ironed out. One rests with the patient who runs to the doctor for everything. There is the question, also, of consultations which are easily abused.

In general, the difficulties of instituting and carrying out prepayment plans for complete medical service, with free choice of physician, are fourfold:

1. An Enabling Act is necessary.

2. There is no agreement among doctors as to fees or as to the amount of service to be covered, whether for surgical and medical benefits in the hospital, or for complete service in the home, office and hospital. The problem is different, of course, where a limited panel of doctors offers the service and controls the funds.

3. Restrictions on the patient are difficult. Some patients might make unnecessarily heavy demands on the service.

4. There is no standard among physicians as to the service necessary in any individual case.

Field Must Be Divided

Experience so far seems to indicate that any sound effort to provide medical care on a prepayment basis should first divide the field of possible services into three groups: (1) surgical benefits in the hospital; (2) surgical and medical benefits in the hospital; (3) complete care in the home, office and hospital. It seems to indicate, also, that complete care is relatively expensive and difficult to administer and that the most tangible and most easily administered and controlled type of care is limited to surgery in the hospital.

Experience has shown further, that the plan must be saleable as well as economically sound. This is a rock against which many plans are foundering. It is the lower income groups that these plans are designed chiefly to reach, since people with means need no such help. But, if the premiums are too high, then only the people with means and foresight will purchase the protections. That is exactly what has happened in several carefully observed experiments and neither needy patients nor doctors benefited.

To Reach the Hard-pressed

It should not be forgotten that the real object of all prepaid medical plans is to reach, not the well-to-do, but the hard-pressed or the improvident or under-paid and provide them with essential service at prices they can afford to pay.

THE COUNCIL MEETS

Foundations for significant expansion in three directions were laid by the Council at their first fall meeting in St. Paul.

Beginning in 1941, the Minnesota State Medical Association will launch a unique study of blindness in one county in Minnesota under auspices of its Committee on Ophthalmology.

The association will coöperate with the State Board of Health to set a standard for accreditation in human tuberculosis control, first in the world, for Minnesota.

The Council approved as reasonable a new schedule of allowances for medical care given to rural relief and Social Security clients which was drawn up by the Division of Social Welfare in coöperation with a committee of the Council. This schedule provides an allowance to physicians of approximately 66⅔ per cent of standard fees, and will be advised by the Division for use of all county welfare boards.

This is the first time in all the history of negotiations between the Council and relief or welfare agencies that any such schedule of allowance has earned the official stamp of approval of an official agency of the medical association. It represents a further step in the present well established relationship between physicians and welfare boards and offers a sound basis for care for the needy in Minnesota.

New Program for the Blind

Dr. F. E. Burch, head of the Minnesota Society for the Prevention of Blindness, presented the plan for the survey of blindness in a Minnesota county to be selected. He asked for an appropriation of $500 from state association funds and promised to secure other funds from interested individuals to provide a sufficient amount for the survey. Due to the fact that eye defects are found to be a serious factor in rejection of draftees and that there is no reliable information as to the ages when these defects have their origin or as to how general they are in the population, the present study promises to make a genuine contribution not only to scientific knowledge but to the national defense.

Accreditation for Human Tuberculosis

The plan to accredit Minnesota counties for human tuberculosis control is a logical outcome of the county-wide survey of Meeker County now in progress under auspices of the Committee on Tuberculosis, Chairman J. A. Myers told the Council. It is expected to provide an important stimulus to tuberculosis work everywhere just as the plan of county accreditation for tuberculosis control among cattle did in the early 20's. The standards set by the committee and approved by the Council, subject to conference with the State Board of Health, are as follows: a tuberculosis death rate of 10 per cent or less per 100,000 population; a tuberculosis infection rate of 10 per cent or less among senior high school students. Plans for certifying county rates and awarding certificates have yet to be drawn up, Dr. Myers said.

Legislation

Among new bills introduced in Washington lately are two, at least, which are disquieting to physicians and public health officials. One, introduced by the Railroad Retirement Board, would have the effect of creating a state insurance scheme to take care of all injured employes and would be the cause of doing away with all the surgical departments of the railroads.

The other is the bill, still waiting House action, which would amend section 40 of the United States Employes Compensation Act to include under the term "physician" osteopaths and chiropractors within the scope of their practice as defined by state law. Both were referred by the Council to the Committee on Public Policy.

Visual Standards

The complete report of the Committee on Visual Economics of the American Medical Association will be reprinted at the request of the Council in an early issue of Minnesota Medicine. Watch for it and save it. This report provides the new and official standards for measuring disability of the eyes with reference to compensation cases.

STILL IN THE DARK

The President's plan for rehabilitation of rejected draftees was couched in general terms; but health and draft board officials who may be expected to put it into effect are still in the dark as to what the administration really expects of them.

According to the statement released to the press, rejectees with correctible defects will be sent to their physicians for remedial treatment and fees will be paid for those who cannot pay for themselves out of government funds.

The rub seems to be that there is no appropriation for payment of such fees. Will the doctors, who are already contributing so much to national defense, be asked to undertake this task, also, without remuneration?

The answer will come out of the huddles soon. In the meantime medical men whose patriotism is surely beyond question will not be blamed for wondering what this latest step may mean to them and to the practice of medicine in the United States.

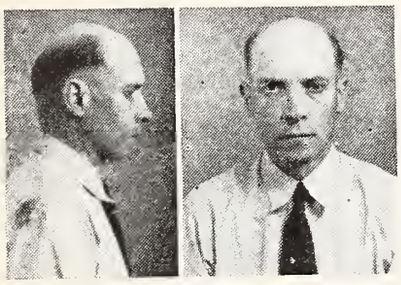
MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Minneapolis Abortionist Sentenced to Two Years to Life Imprisonment

RE: State of Minnesota vs. David E. Rhoades, also known as David Smith, also known as Bill Wilson, also known as Eugene Brown.

On October 6, 1941, David E. Rhoades, forty years of age, entered a plea of guilty in the District Court of Hennepin County to an indictment charging him with the crime of abortion and three previous felony convictions. Rhoades was sentenced by the Honorable Frank E. Reed, Judge of the District Court, to serve a term at hard labor in the State Prison at Stillwater "according to law." Under this sentence Rhoades will have to serve not less than two years, and not more than life imprisonment. The statutory sentence for abortion is not to exceed four years, but Rhoades was sentenced as a habitual criminal and accordingly received a much more severe sentence.



Following a joint investigation by the Women's Bureau of the Minneapolis Police Department and the Minnesota State Board of Medical Examiners, Rhoades was arrested by the Minneapolis police officers on August 28, 1941. His arrest followed the admission of a twenty-year-old girl to Minneapolis General Hospital for treatment following a criminal abortion. Rhoades was arrested in the office of William L. Sheperdson, a licensed osteopath, at 315 Masonic Temple Bldg., Minneapolis. Sheperdson was also arrested and on September 16, 1941, Rhoades and Sheperdson were indicted, in separate cases, by the grand jury of Hennepin County for the crime of abortion. Rhoades entered a plea of not guilty and his case was set for trial for October 1, 1941, with bail being fixed in the sum of $5,000.00. Rhoades was remanded to the County Jail because of his inability to furnish the bail. On September 22, 1941, Mr. Orell Leen, Rhoades' attorney, filed a petition in the District Court of Hennepin County, alleging that Rhoades was insane and asking the Court to refer the matter to the Probate Court of Hennepin County for an examination into Rhoades' mental condition.

Rhoades' record discloses that on February 14, 1925, he was adjudicated an insane person in the Probate Court of Hennepin County and committed to the State Hospital at Rochester. He was discharged from the Hospital twenty-five days later by order of Dr. Arthur F. Kilbourne, Superintendent. The discharge set forth that Rhoades was not insane. Rhoades' record also discloses that on November 8, 1935, he was adjudged a feeble minded person by the Probate Court of Hennepin County, and again committed to the State Hospital at Rochester. On November 26, 1935, Rhoades was transferred to the State Hospital at St. Peter, from which institution he escaped on September 18, 1939. On August 7, 1920, Rhoades entered a plea of guilty in the District Court of Hennepin County to the crime of grand larceny in the first degree and was sentenced to the State Reformatory at St. Cloud. He served his sentence, and on December 6, 1928, Rhoades again pleaded guilty in the District Court of Hennepin County to a charge of grand larceny in the second degree. He was sentenced to the State Prison at Stillwater and served his sentence. On January 7, 1935, Rhoades pleaded guilty in the District Court of Scott County to a third charge of grand larceny. On this occasion he was sentenced to serve one year at the State Prison at Stillwater. In the instant case Judge Reed made an order referring the matter to the Probate Court for a sanity examination which was held on October 1, 1941. The Examining Board consisted of the Honorable Manley L. Fosseen, Judge of the Probate Court, N. J. Berkwitz, M.D. and Martin Aune, M.D. Rhoades admitted that he knew the difference between right and wrong and that he was committing a crime when he performed criminal abortions. The Examining Board found him sane, the Board stating: "This individual knows the difference between right and wrong, but appears to be willing to take the easiest way, according to his own admission." The matter was then referred back to the District Court where he entered a plea of guilty on October 6, 1941, and was sentenced as detailed above.

Rhoades, who admitted that he has no medical training of any kind, stated that he became acquainted with the defendant Sheperdson while both were serving sentences in the Minneapolis Workhouse, Sheperdson for contempt of Court for failure to pay alimony and Rhoades for vagrancy. Rhoades also stated that he and Sheperdson were associated together in about fifteen criminal abortions. Sheperdson has entered a plea of guilty, but as of this date has not been sentenced, his case being under investigation by the Probation Officer of Hennepin County.

This case, as will be noted, has many unusual features and was one of the most difficult ones to dispose of. Notwithstanding the fact that Rhoades is only forty years of age, he has served approximately fourteen years in state penal institutions, and another four years in state hospitals for the insane. The Minnesota State Board of Medical Examiners wishes to particularly direct attention to the high type of coöperation received in the case from the Minneapolis Police Department, and particularly the Women's Bureau and the Detective Bureau. A large amount of time was also devoted to this case by Mr. Ed J. Goff, County Attorney, and two of his assistants, Mr. Peter S. Neilson and Mr. Allen Rorem. Legal counsel for the defendant asked the Court to limit the defendant's sentence, but Judge Reed stated that, in his opinion, the defendant was a habitual criminal and was better off in a state penal institution. Under the sentence imposed, Rhoades cannot be released except by order of the State Board of Pardons or the State Board of Parole.

* * *

Two Duluth Women Sentenced to Fifteen Months Each at Shakopee Reformatory

Re: State of Minnesota vs. Minnie Hanson.
Re: State of Minnesota vs. Laura McLean.

On October 8, 1941, Minnie Hanson, forty-five years of age, and Laura McLean, fifty-eight years of age, were sentenced by the Honorable Mark Nolan, Judge of the District Court at Duluth, to a term of fifteen months each in the Women's Reformatory at Shakopee. The defendants were jointly charged with the crime of abortion in an information filed against them on September 25, 1941, by Thomas J. Naylor, County Attorney of St. Louis County. The defendants were arrested on September 19, 1941, following the admission to a Duluth Hospital of a young girl who was suffering from the effects of a criminal abortion. The girl made a statement involving both defendants, and they

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INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases
J. L. McLeod, Grand Rapids, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
G. L. Berdez, Duluth
T. G. Clement, Duluth
W. S. Lemon, Rochester
T. A. Lowe, South Saint Paul
R. I. Rizer, Minneapolis
S. E. Sweitzer, Minneapolis
O. H. Wangensteen, Minneapolis
A. E. Wilcox, Minneapolis

INDUSTRIAL HEALTH — A NEW SERVICE IN THE STATE DEPARTMENT OF HEALTH

Although the existence of occupational diseases has been known for centuries, the systematic control and the desire to prevent them is of fairly recent origin. Soon after the World War, the Division of Industrial Hygiene of the U. S. Public Health Service was formed; professional societies sprang up; state boards of health and labor created industrial health units; and various other governmental and private agencies became interested in the program. Industry was stimulated to join the movement by a growing recognition of its responsibility to protect the health of its workers; through the passage of workmen's compensation acts, and by the realization that among industrial workers, illness, much of which is preventable, causes at least fifteen times as much absenteeism as do industrial injuries. The indirect or hidden costs of industrial absenteeism have been calculated to be four times the costs of compensation and medical care. It has been estimated that the total costs of sickness in industry for the United States is five billion dollars annually.

Broad Viewpoint Needed

In view of the fact that the specific occupational diseases cause only a small fraction of the total disability and lost time of the wage earner due to illness, it becomes obvious that those engaged in industrial health activities must adopt a more broad viewpoint and safeguard the health of the worker against disease from all causes. There is evidence that the morbidity and mortality rates of certain industrial groups are higher than in the general adult population or than in the industrial population as a whole. Studies conducted in a number of industries have shown a high incidence of certain diseases commonly considered as non-occupational; such as tuberculosis, pneumonia, and the degenerative diseases. While it is true that much of the disease among wage earners is due to harmful dusts, vapors, fumes, chemicals, excessive temperatures, and faulty plant sanitation, yet we cannot disregard the effects of improper living conditions, hurry, strain, malnutrition, and communicable diseases. It becomes apparent then that, in order for a state industrial health unit to fill such a broad purpose, it must act as a coördinating unit between other units of the state health department. Thus the industrial health unit finds itself in an especially advantageous position to bring public health to an unusually large and important group of the adult population.

"Most Effective Work"

As Mr. J. J. Bloomfield, of the Division of Industrial Hygiene, U. S. Public Health Service, has pointed out, many of the diseases of childhood are not directly associated with the school environment, yet health departments and physicians have done their most effective work in the prevention of childhood diseases through the medium of the school. The same procedure may be attempted in combating adult disease through the medium of the factory. In other words, there is no reason why the health department cannot carry on a program dealing with venereal disease or tuberculosis control through the industrial groups.

Minnesota, with 210,000 employes in the manufacturing, mechanical, and mineral industries (1930 census), ranks twenty-second among the states according to the number of employes in the above groups. This position is only 32,000 removed from the state occupying fifteenth place. With this position of industrial importance, the State has long recognized the need of an industrial health unit in the Department of Health. It was not until 1939 that the Legislature passed an act specifically authorizing this Department to investigate and make recommendations for the control of occupational disease.

Reporting Required

This act also requires the reporting of occupational diseases by physicians to the State Department of Health. Early in 1940, an Industrial

(Continued on Page 980)

In Memoriam

Lemuel M. Roberts

Dr. L. M. Roberts, of Little Falls, died October 9, 1941, after several months of failing health, at the age of seventy-nine.

Dr. Roberts was born in Glendale, Ohio, February 23, 1862. He attended the grade schools of Cincinnati and then spent three years at Urbana University, Urbana, Ohio, before taking a year at the University of Cincinnati. He then attended the Michigan Homeopathic Medical College at Ann Arbor, completing his medical course at the Hahnemann Medical College of Philadelphia in 1883.

Shortly after his graduation, Dr. Roberts was appointed to a position in the government service as physician and surgeon at the Quapaw Indian Agency in Oklahoma. After two years he went to Brainerd, Minnesota, where he practiced for five years.

In 1890 Dr. Roberts went to Little Falls, where he practiced until his retirement. He took postgraduate work in London, Berlin and Vienna in 1894 and twice at later dates in Chicago.

In 1887 Dr. Roberts married Helen Gertrude Cooley of Ohio. Mrs. Roberts died in 1896 and Dr. Roberts married Ida M. Deppman in 1904. She and a son, Clifton Shears Roberts, and seven grandchildren survive.

Dr. Roberts took an active part in medical and fraternal organizations and was a member of the Upper Mississippi Medical Society, the Minnesota State and American Medical Associations. An injury received in an airplane accident in 1936 while escorting a patient to Rochester impaired Dr. Roberts' health, but he continued his active practice until 1938.

INDUSTRIAL HEALTH

(Continued from Page 979)

Hygiene Unit was organized to carry out this activity under the joint supervision of the Division of Sanitation and the Division of Preventable Diseases. In June, 1941, the State Board of Health changed the status of the Industrial Hygiene Unit to that of a Division of Industrial Health.

The general function of the Division of Industrial Health is to offer a technical medical and engineering advisory service to industry for the control of industrial health hazards. A more detailed description of its functions and the services it has to offer will appear in a later article.—L. W. Foker, M.D., Director, Division of Industrial Health, Minnesota Department of Health.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

(Continued from Page 978)

were promptly arrested by Duluth police officers. When arraigned in the Duluth Municipal Court, the defendants demanded a preliminary hearing, and the Court set bail in the sum of $2,500.00 each. The defendants were unable to furnish the bail and they were remanded to jail. On September 24, 1941, the defendants were held to the District Court where they each entered a plea of guilty on October 3, 1941, the Court fixing October 8, 1941, as the date for sentencing the defendants.

Both of the defendants have previous police records, Mrs. Hanson having been convicted on January 9, 1924, of disorderly conduct, and being sentenced to twenty-five days. On February 1, 1924, she received a sixty-day sentence for disorderly conduct, and on June 16, 1933, was sentenced to thirty days for petty larceny (shop lifting). Mrs. McLean was fined $100.00 on July 26, 1929, for illegal possession of liquor, and on September 29, 1929, was given sixty days in jail for a similar offense. Mrs. Hanson, at the time of her arrest, resided at 1909 Greysolon Road, Duluth, and Mrs. McLean resided at 1115 East Third Street, Duluth. Judge Nolan refused to suspend the defendants' sentences, and the record of both defendants indicate that they were not entitled to probation.

The very fine results achieved in this case reflect the prompt and efficient work done by the Duluth Police Department, County Attorney Thomas J. Naylor, and his assistant, Walter F. Dacey. Both of the defendants were a menace to the community and neither Mrs. Hanson nor Mrs. McLean have any medical training whatsoever and hold no license to practice any form of healing in the State of Minnesota.

ADEQUATE RELIEF SAVES DOLLARS

One of the biggest bones of contention in the relief problem is the matter of administration—whether it should be under the county system or the township system. About two-thirds of the counties in Minnesota operate under the county system while most of the rest, Swift county included, have the township system and a few handle their relief problem under a compromise arrangement between the two systems.

Proponents of the township system point out that relief costs are less under that form of administration and argue that each governmental unit should have the power to handle its own relief problems.

It is true that Swift county relief costs have been appreciably lowered since the change back to the township system but the lower cost is not entirely due to the change in system. There is no question that relief needs in Swift county as a whole have been considerably less during the last year due to improved conditions.

Also in the matter of adequacy of relief aid given, there is little question that more adequate relief is given under the county system and naturally relief costs would be somewhat higher on that account. But adequate relief now may save many dollars later so that in the long run the county system is cheaper than the township even in that respect.—From the *Swift County Monitor.*

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR NOVEMBER

The Minnesota State Medical Association broadcasts weekly at 10:45 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota.

November 1—Common Cold.
November 8—Influenza.
November 15—Pneumonia.
November 22—Tuberculosis.
November 29—History of Dentistry.

MINNESOTA MEDICAL FOUNDATION

The second annual meeting of the Minnesota Medical Foundation will be held November 7 at the Coffman Memorial Union on the University of Minnesota campus.

Guest speaker will be Dr. Morris Fishbein, editor of *The Journal of the American Medical Association.* His subject will be "Medicine and the National Emergency."

Officers will report on activities of the Foundation during the past year, future plans will be discussed, and trustees will be elected. Present officers are: Dr. Erling S. Platou, president; Dr. Robert L. Wilder, secretary, and Dr. Jennings C. Litzenberg, treasurer. All are of Minneapolis.

MINNESOTA PATHOLOGICAL SOCIETY

Speakers for the November and December meetings of the Minnesota Pathological Society are announced.

On November 19, Dr. Melvin H. Knisely, assistant professor of anatomy, University of Chicago and University of Tennessee, will speak on "The Effects of Plasmodium Malaria on the Blood Vascular System," and will illustrate his talk with kodachromes. Dr. Knisely has been loaned by the University of Chicago to the University of Tennesse and the Tennessee Valley Authority for the year 1941-42 to continue studies of anti-malaria drugs on the parasites and on the hosts.

Dr. Karl F. Meyer of George Williams Hooper Foundation, University of California Medical Center, San Francisco, will address the Minnesota Pathological Society, December 16, at its meeting in the Amphitheater of the University of Minnesota Anatomy Building. His subject will be "The Animal Kingdom, a Reservoir of Infection."

A symposium on equine encephalomyelitis was conducted at the October 21 meeting of the Minnesota Pathological Society. Dr. Leonard W. Larson of Bismarck, North Dakota, presented clinical features; Dr. Carl M. Eklund of the Minnesota State Board of Health, epidemiology; and Dr. A. B. Baker of the University of Minnesota, pathology. Taking part in the discussion were Dr. Reuel Fenstermacher, University of Minnesota veterinarian, and Dr. Alex Blumstein of Minneapolis.

SOUTHERN MINNESOTA MEDICAL ASSOCIATION

Approximately 100 physicians attended the annual meeting of the Southern Minnesota Medical Association in Mankato, September 29.

Scientific sessions were conducted in the morning and the afternoon, and the meeting was climaxed in the evening with a banquet. Speakers at the banquet included Gideon Seymour, editorial writer for the *Minneapolis Star Journal* and former Associated Press foreign correspondent, whose topic was "Around the World in 2,280 Days"; Dr. B. J. Branton, president of the Minnesota State Medical Association, who discussed the question, "Will Organized Medicine Survive?"; and Dr. W. H. Valentine of Tracy, Association president, who delivered the annual president's message.

Dr. N. W. Barker of Rochester, secretary-treasurer during the past year, was elected president of the Association to succeed Dr. Valentine.

A paper written by Dr. E. H. Juers of Red Wing won the medal awarded annually by the Association for the leading paper presented by a member during the program. Dr. Juers' paper dealt with epiploitis.

The medal for a case history presented on the program went to Dr. P. E. Hermanson of Hendricks, whose report dealt with a case of pregnancy occurring outside the uterus.

The program for the meeting follows:

Morning Session

An Exhibit on Fractures.....Dr. W. C. Stillwell, Mankato
Epiploitis.....Dr. E. H. Juers, Red Wing
Résumé of County Examinations of Draftees.....
Dr. H. B. Troost, Mankato
Idiopathic Auricular Fibrillation: Its Prognosis and Treatment.....Dr. Thomas Dry and Dr. Fred A. Willius, Rochester
Alcoholics Anonymous....Dr. Joseph C. Michael, Minneapolis
Henoch's Purpura.....Dr. C. Koenigsberger, Mankato
Differential Diagnosis and Treatment of Hemorrhagic Diseases.....Dr. C. H. Watkins, Rochester
Studies on the Etiology and Serum Treatment of Encephalitis During the Epidemic in Minnesota and North Dakota in 1941.....Dr. E. C. Rosenow, Rochester
Use of Vitamin B_1 in General Practice.....
Dr. Oliver J. Morehead, Ritzville, Wash.

Afternoon Session

Factors Productive of Disabilities in Ankle Fractures.....
Dr. Harry Macey, Rochester
Toxemias of Pregnancy.....Dr. Fred L. Adair, Chicago
Modern Treatment of Menopause.....
Dr. Samuel H. Geist, New York City
Fistulas between the Urinary Tract and Vagina.....
Drs. J. C. Masson and Robert B. Wilson, Rochester
Modern Treatment of Pneumonia.....
Dr. Harry G. Wood, Rochester

Other case reports were given by Dr. R. F. Hedin, Red Wing, and Dr. W. R. Schmidt, Worthington.

Wives of visiting physicians were entertained during the day by the Blue Earth County Medical Society auxiliary.

WABASHA COUNTY MEDICAL SOCIETY

Dr. Robert A. Glabe of Plainview was elected president of the Wabasha County Medical Society at its seventy-third annual meeting, October 9, in Wabasha. He succeeds Dr. D. G. Mahle of Plainview.

Other officers named are: Dr. T. G. Wellman, Lake City, vice president: Dr. W. F. Wilson, Lake City, secretary-treasurer. Dr. E. C. Bayley of Lake City was named a delegate to the State Association; Dr. B. J. Bouquet of Wabasha, alternate; Dr. W. H. Replogle, Wabasha, censor for three years. Censors holding over are Dr. Mahle, Plainview, and Dr. W. J. Cochrane, Lake City.

Thirty-one persons attended the dinner, at which the Wabasha physicians were hosts. Guests included three officers of the Minnesota State Medical Association: Dr. B. J. Branton, Willmar, president; Dr. H. Z. Griffin, Rochester, president-elect; and Dr. L. A. Buie, Rochester, district councilor.

Tribute was paid Dr. W. J. Cochrane, who recently retired from active practice. He was praised for his many years of service to the community and the medical associations.

A fountain pen and pencil set, on which were engraved his name, was presented to Dr. W. F. Wilson of Lake City in recognition of his entering upon his forty-fifth year as secretary of the county medical society. The presentation was made by Dr. Mahle.

The following scientific program was presented:

President's Address—"Undulant Fever; with Case Reports," Dr. D. G. Mahle, Plainview.
"Enuresis"—Dr. Edward N. Cook, Rochester.
"Ligation in Treatment of Varicose Veins"—Dr. T. G. Wellman, Lake City.
"Carcinoma of the Cervix: Some Observations Regarding Management and Treatment"—Dr. Victor Bruder, radiologist, Winona General Hospital and LaCrosse Lutheran Hospital.

The Woman's Auxiliary of the Wabasha County Medical Society was entertained at the home of Mrs. B. J. Bouquet following the dinner. Plans for the tuberculosis radio essay contest were discussed.

WEST CENTRAL MEDICAL SOCIETY

Dr. F. W. Behmler of Morris was reëlected president of the West Central Medical Society at the annual meeting at Morris, October 8. Dr. Otto Bergan of Clinton was elected vice president, and Dr. Herman Linde of Cyrus, secretary.

Papers were read at the meeting by Dr. H. E. Miller and Dr. Maynard Nelson of Minneapolis.

WOMAN'S AUXILIARY

Mrs. John J. Ryan, *President*
Saint Paul, Minnesota
Mrs. L. R. Boies, *Publicity Chairman*
Knollwood, Hopkins, Minnesota

COUNTY PRESIDENTS and PRESIDENTS-ELECT, 1941-1942

The following women have been elected for offices in their respective counties:

Blue Earth
President—Mrs. E. W. Benham, Mankato
Clay-Becker
President—Mrs. O. O. Larsen, Detroit Lakes
East Central
President—Mrs. A. B. Roehlke, Elk River
Goodhue
President—Mrs. R. V. Sherman, Red Wing
Hennepin
President—Mrs. F. S. McKinney, Minneapolis
President-Elect—Mrs. James N. Johnson, Minneapolis
Lyon-Lincoln
President—Mrs. W. H. Workman, Tracy
Mower
President—Mrs. W. B. Griese, Austin
Nicollet-Le Sueur
President—Mrs. Edmund W. Miller, Saint Peter
Olmsted-Houston-Filmore-Dodge
President—Mrs. Mark Anderson, Rochester
Park Region
President—Mrs. L. C. Comebacker, Fergus Falls
Ramsey
President—Mrs. Mark E. Ryan, Saint Paul
President-Elect—Mrs. George A. Williamson, Saint Paul
Red River Valley
President—Mrs. W. H. Hollands, Fisher
Redwood-Brown
President—Mrs. O. B. Fesenmaier, New Ulm
Renville
President—Mrs. R. E. Erickson, Hector
Rice
President—Mrs. Arthur W. Neutzman, Faribault
St. Louis
President—Mrs. P. S. Rudie, Duluth
President-Elect—Mrs. D. W. Wheeler, Duluth
Scott-Carver
President—Mrs. F. C. Westerman, Montgomery
Southwestern Minnesota
President—Mrs. B. O. Mork, Jr., Worthington
Stearns-Benton
President—Mrs. P. E. Barringer, Saint Cloud
Upper Mississippi
President—Mrs. A. E. Amundson, Little Falls
President-Elect—Mrs. H. W. Lee, Brainerd
Wabasha
President—Mrs. E. W. Ellis, Elgin
Washington
President—Mrs. C. H. Sherman, Stillwater
West Central
President—Mrs. A. F. Geisen, Starbuck
Winona
President—Mrs. H. Heisie, Winona
Wright
President—Mrs. F. E. Ellison, Monticello

STATE SOCIAL COMMITTEE

Mrs. J. M. Neal, Minneapolis
Mrs. Lloyd G. Dack, Saint Paul
Mrs. W. J. Ryan, Duluth
Mrs. George Eusterman, Rochester

STATE CHAIRMEN OF STANDING COMMITTEES

Organization—Mrs. W. W. Moir, Minneapolis
Finance—Mrs. Charles W. Wass, Saint Paul
Legislation—Mrs. John J. Catlin, Buffalo
Public Relations—Mrs. E. C. Eshelby, Saint Paul
Health Education—Mrs. J. A. Thabes, Sr., Brainerd
"Hygeia"—Mrs. J. A. Cosgriff, Olivia
Editor, Press and Publicity—Mrs. L. R. Boies, Hopkins
Printing—Mrs. C. Harry Ghent, Saint Paul
Exhibits—Mrs. W. N. Graves, Duluth
Resolutions—Mrs. C. C. Allen, Austin
Archives—Mrs. Joseph B. Gaida, Saint Cloud
Revisions—Mrs. M. S. Henderson, Rochester
"Bulletin"—Mrs. S. S. Hesselgrave, Saint Paul
Co-Chairman—Mrs. R. N. Jones, Saint Cloud

GOODHUE COUNTY

The first official meeting of Goodhue County took place Tuesday, September 22, at the St. James Hotel, Red Wing, in the form of a luncheon. The members were honored with the presence of the state president, Mrs. John J. Ryan, Saint Paul.

Mrs. R. V. Sherman, Red Wing, presided.

HENNEPIN COUNTY

The opening meeting for the Hennepin County Medical Auxiliary honoring new members and officers was held at the home of Mrs. Russell Morse, Friday, October 3. Mrs. F. H. Schaaf with her committee had charge of the tea.

At the business meeting preceding the program, Mrs. F. S. McKinney presented her committee chairmen:

Social—Mrs. J. F. Curtin, and Mrs. Leonard Lang
Philanthropic—Mrs. F. L. Gilles
Health—Mrs. A. C. Tingdale
Telephone—Mrs. Rolla Stewart
Sarahurst—Mrs. E. W. Bedford
Membership—Mrs. W. K. Haven
Program—Mrs. Wm. Rucker
Printing—Mrs. D. Kirk Pollock
Flowers—Mrs. J. M. Hayes
Finance—Mrs. S. V. Hodge
Hospitality—Mrs. J. M. Hall
State Exhibit—Mrs. Malvin Nydahl
Clipping—Mrs. Theodore Sweetser
Parliamentarian—Mrs. W. J. Byrnes
Editor and Press—Mrs. R. R. Heim
Historian—Mrs. C. E. Willcutt
Archives—Mrs. W. D. Pollard
Legislative and Bulletin—Mrs. James Blake
Public Relations—Mrs. Harlow Hanson
Christmas Seals—Mrs. C. A. Aling
Key—Mrs. L. R. Boies

Other officers for the year include:

President Emeritus—Mrs. W. J. Byrnes
President-Elect—Mrs. James A Johnson
First Vice President—Mrs. J. S. Reynolds
Second Vice President—Mrs. E. J. Huenekens
Treasurer—Mrs. Wm. R. Jones
Recording Secretary—Mrs. John Moe
Auditor—Mrs. Elmer Lundquist
Custodian—Mrs. W. G. Beckman

Mrs. William Rucker then presented Laura Mae Carpenter and Peggy Nichols in "Modern Readings with Musical Backgrounds."

MOWER COUNTY

At the last meeting of the year, Mower County Auxiliary chose the following officers:

President—Mrs. W. B. Grise
Vice President—Mrs. C. L. Sheedy
Secretary—Mrs. Carl Eckhardt
Treasurer—Mrs. J. G. W. Havens

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTIES

Mrs. Mark Anderson, president of Olmsted-Houston-Fillmore-Dodge County Auxiliary, presided at the luncheon for the first fall meeting of the year held at Rochester Country Club, Rochester. Bridge followed.

RICE COUNTY

A tea was held at the home of Dr. and Mrs. E. J. Engberg, Faribault, Minnesota, for the first meeting of the season for Rice County. It was a pleasure to have, as special guest, Mrs. John J. Ryan, Saint Paul. She spoke to the group on the importance of nutrition, which will be emphasized in this year's program.

Officers and committee chairmen for the year include:

President—Mrs. A. W. Neutzman
Secretary-Treasurer—Mrs. E. J. West
Public Relations—Mrs. P. F. Meyer
Hygeia—Mrs. S. W. Stevenson
Bulletin—Mrs. A. M. Hanson
Legislation—Mrs. E. J. Engberg
Publicity—Mrs. Paul H. Weaver

The Auxiliary held its second meeting at the home of Mrs. Paul Meyer, with Miss Caroline Perkins, social service worker at the Minnesota State School and Colony, as speaker.

STEARNS-BENTON COUNTY

Auxiliary members of Stearns-Benton County have been busy this summer. In August, they were hostesses to the wives of doctors attending the Northern Medical Association meeting in Saint Cloud. Prominent in formulating plans and helping with the entertainment were: Mrs. P. E. Barringer, Mrs. Joseph B. Gaida, Mrs. Harry B. Clark, Mrs. William Friesleben, and Mrs. R. N. Jones, Mrs. W. H. Rumpf. Prominent guests were: Mrs. B. J. Branton of Willmar, wife of the president of the State Medical Association, and Mrs. John J. Ryan, St. Paul, State Auxiliary President.

CASE HISTORY No. 107

IRRITANT DERMATITIS

Mrs. S. S.—Symptoms: Eruption on neck and ear. Also swollen eyes, from time to time. Formerly used ordinary cosmetics. Change to AR-EX Cosmetic régime, together with soothing local treatment, brought about prompt involution of condition.

More doctors than ever are prescribing AR-EX Cosmetics today, for their purity and freedom from irritants and known allergens.

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THE ZEMMER CO., Oakland Sta., Pittsburgh, Pa.

MINNESOTA STATE MEDICAL ASSOCIATION

Eighty-eighth Annual Session

May 25, 26, 27 and 28, 1941

Saint Paul, Minnesota

HOUSE OF DELEGATES

Sunday, May 25, 2:00 P.M.

The first meeting was called to order Sunday, May 25, at 2:00 p.m. by Dr. W. W. Will, Bertha, Speaker.

Following a report from Dr. F. J. Lexa, chairman of the Credentials Committee, that a quorum was present, it was moved, seconded and carried that reading of the minutes of the last meeting be dispensed with and at the request of the Speaker, Dr. H. Z. Giffin, Chairman of the Council, presented the report of the Council.

DR. GIFFIN: The complete report of the Council is in the hands of the Reference Committee but special attention of the delegates might be called to the following points in the report: that the first meeting of the delegates this year is being held in the afternoon instead of the evening to give plenty of time for proper consideration of reports; that the late Dr. C. B. Wright was awarded the distinguished service medal of the Association by the Council, subject to approval of the House of Delegates at this meeting, and the House will be glad to know that he was informed of the preliminary action of the Council while he was still at the hospital in Rochester; that the Committee of the Council to study medical testimony was made a permanent committee to review court cases in which medical testimony appears to the court to have been so contradictory as to indicate that the witness might be consciously deviating from the truth; that Dr. J. M. Hayes has been appointed delegate to the American Medical Association, subject to the approval of this House, to assume the post created by reapportionment of delegates, with Dr. W. W. Will as his alternate; that a committee was appointed to consider the question of dues of members called to active military duty and, on the basis of the report, it was decided to request local societies to assume responsibilities for dues of those unable to pay. It was also decided to maintain an approved pool of physicians who might substitute for men called to service. At yesterday's meeting routine matters, including the very satisfactory financial situation of the Association, were discussed. Also Dr. L. L. Sogge and Mr. F. Manley Brist reported on the year's work with the Legislature and the Council gave them a rising vote of thanks for their splendid record. The following nominations were made subject to approval by this House for delegates and alternates to the American Medical Association:

Delegate—Dr. F. J. Savage	**Alternate—Dr. George Earl**
Delegate—Dr. A. W. Adson	**Alternate—Dr. W. W. Will**
Delegate—Dr. J. M. Hayes	**Alternate—Dr. W. L. Burnap**

Report of the Committee consisting of Drs. E. M. Jones, F. J. Elias and B. S. Adams to re-arrange the bylaws governing organization of committees was accepted by the Council and will be presented to you at the convenience of the Speaker.

It was moved, seconded and carried that the report of the chairman of the Council be accepted.

Chairman Will then called for the report of the Reference Committee on Miscellaneous Scientific Reports, Dr. E. M. Hammes, chairman. The following committee reports were reviewed:

HISTORICAL COMMITTEE

Your Historical Committee has published in MINNESOTA MEDICINE, beginning with January, 1938, and containing to date, the narrative of Medicine in the following counties:

St. Louis	Chisago	Hennepin	Dakota
Washington	Ramsey	Winona	Brown

The following manuscripts have also been published:
Biography of Dr. Thomas S. Williamson—Doctor Hamilton
Diseases of the Dakota Indians—Dr. Thomas S. Williamson

The histories of the following counties, and several manuscripts are at hand, but have not yet been published:
Edward Purcell, the first physician in Minnesota
Biography of Dr. William Sitgreaves Cox
Nicollet County
Asiatic Cholera in St. Paul
Minnesota Valley Medical Society
Mower and Freeborn Counties
Kittson County
Wabasha County
Goodhue County
Medical books of W. W. Mayo
Steele and Le Sueur Counties
Brown County (In publication)
Scott and Carver Counties
Homœopathy in Minnesota

The following minor papers are on hand:
Medical societies and public health
Beginning of the Mayo Clinic
Medical instruction
Medical journalism
Early practice of medicine in Minnesota
Medical men and fur traders
Dakota medicine
The advent of the frontier practitioner
Fairchild—First period of practice of medicine
Walling—Pioneer practice in the Northwest
Hospitalization and Public Health

Other histories and manuscripts have been promised.

All members are urged to see the Minnesota State Medical Association exhibit, "March of Medicine in Minnesota," showing, by selectro-slide, 100 years of medicine since the coming of Christopher Carli, first civilian practitioner in Minnesota, to the Dakotah territory, May 24, 1841.

MONTE C. PIPER, M.D., *Chairman*

COMMITTEE ON MILITARY AFFAIRS

1. *Army.*—Medical Department Reserves for the State as of May 1, are 664, classified as follows:

Active Status		*Extended Active Duty*	*Total*
Medical Reserves	187 plus	220	407
Dental Reserves	99 plus	61	160
Vet. Reserves	43 plus	19	62
Med. Administration	7 plus	8	15
Sanitary Reserves	5 plus	15	20
			664
National Guard		Extended active duty	21

Navy—

Active Status		Extended active duty	Total
Medical Reserves	33	17	50
Dental Reserves	7	3	10

2. *Legislation.*—With the expansion of the army the Medical Reserve Corps is barely adequate in personnel to fill the positions provided for in regulations. The army by July 1, will

require 9,100 Medical Officers of whom between 6,000 and 7,000 will be filled by Reserve Officers.

In order to maintain the quotas for the future, recent legislation has not only made it possible for seniors of qualified Medical Schools to be offered commissions upon completion of satisfactory internship, but, that bona fide students of the Medical Schools giving reasonable promise of becoming acceptable physicians were to be deferred by local boards as long as students progressed satisfactorily. (Authority, Memo 5-3-41 Brig. Gen. Lewis B. Hershey).

3. War Department ruling regarding appointments provide for appointment to the Medical Reserves when placed on extended active duty for one year. Resignation can be obtained by officers below the grade of Captain and giving sufficient cause for such action.

4. The War Department desires that no ineligible Reserve Officer shall be selected for extended active duty except upon specific approval of the department in each individual case. It is assumed that short periods of training will not be offered Reserve Officers of company grade as in previous years due to the army mobilization.

5. *Air Corps.*—Medical Reserves applying for flight examiners are required to spend six weeks of training at an Air Corps Medical Training School. Flight Surgeon is only available to members of the regular army and those of the reserves who served one year on active duty in addition to six weeks' preliminary training.

6. *CCC*—Due to the shortage of Medical Reserves, the camps are being supplied by civilian physicians, contract surgeon basis. Upward of 37 camps will be in operation in Minnesota this year.

Legislation in the last Congress provided for uniform allowance to R.O.T.C. graduates. The bill asking for travel allowance on inactive status still is in the hands of the Military Committee.

7. *Activities.*—The 12th Annual Medico-Military Inactive Status Training Unit was held in Rochester under the auspices of the Mayo Foundation, October 6-20, 1940. The attendance was excellent.

8. Members of the Military Committee were called to assist in selecting specialists to conduct the Induction examinations of the selectees at Fort Snelling. Civilian and Medical Reserve physicians of the Twin Cities and adjacent areas made up the list.

9. The Military Committee was enlarged this year so as to have a representative for each Councilor District.

10. The movement for a new armory at the University of Minnesota should be supported whole-heartedly as under present conditions the physical facilities are inadequate.

11. War Department affiliated units are organized under the direction of the Surgeon General. Two such units are organized in Minnesota, No. 26 at the University of Minnesota and No. 71 at the Mayo Foundation. Civilians receiving brevet commissions in the unit by reason of institutional connection will not be called to any other assignment prior to activation of the unit. Should such a person become detached from the institution by resignation or what not, his commission is automatically cancelled as a member of that unit. A Reserve Officer belonging to such a unit may be detailed to another duty prior to activation of the unit, but is released and returned to the original assignment when the unit becomes active.

12. The problem of satisfactory handling of professional assistance in the communities of the state deprived of physicians who have entered the army is a serious one and after considerable study by the State Medical Association it is believed that the local medical organization aided by the "pool," created by order of the Council, of volunteers for substitute service, can best handle the question of supply to those communities where professional help is needed; also the matter of fee adjustment that might be equitable to both the patient and the physician rendering the service. A specimen contract to cover interests of both physician and substitute was drawn up to aid Reserve Officers who are leaving their practice in the hands of a locum tenens to go on active duty.

COL. F. L. SMITH, *Chairman*

COMMITTEE ON FRACTURES

The Committee on Fractures of the Minnesota State Medical Association held a meeting in Minneapolis on Wednesday, March 12, 1941, jointly with the Minnesota Regional Committee on Fractures of the American College of Surgeons. The committees also attended the afternoon session on Emergency Care and Transportation of Simple and Compound Fractures of the Long Bones of the Extremities, held during the Sectional Meeting of the American College of Surgeons. The committees also observed the demonstrations on the application of First Aid and Transportation Splints presented by medical officers of the United States Army.

The Committee on Fractures of the Minnesota State Medical Association for 1941 consists of at least one member from each of the thirty-three component medical societies, and in nearly every instance this member is chairman of the Committee on Fractures of his county society. Each county in the state is represented. The committee is endeavoring to carry out the recommendations of the Committee on Fractures for the year 1940 as published in MINNESOTA MEDICINE in July, 1940, on pages 511 and 512.

The First Aid and Transportation of Fractures is receiving continued attention and improvement. The Minnesota State Medical Association 16 millimeter movie film on "First Aid and Transportation of Fractures of the Long Bones" and another film on "First Aid and Transportation of Fractures of the Neck and of the Dorsal and Lumbar Spine" are in steadily increasing demand. The films are obtained from Mr. Rosell's office, and there is no charge to members.

In *Life* for January 20, 1941 a Minneapolis intern was shown putting a Thomas splint on a patient with a dislocated patella. In the Rotogravure Section of the *Minneapolis Star Journal* for Sunday, February 2, 1941 the Red Cross Ski Patrol was shown after applying a hinged half ring lower extremity splint to a girl skier with a broken leg. On February 5, 1941, the *Minneapolis Star Journal* showed a Minneapolis intern with a traction splint on a man with a broken leg. The *Minneapolis Morning Tribune* for May 6, 1941, showed two large front-page photographs of patients with the Army type hinged half ring splints on broken legs applied by the attendants of a Minneapolis private ambulance company. This graphic evidence of improvement is in sharp contrast with the picture in the *Minneapolis Journal* of March 10, 1937, when a man with a broken leg is shown being walked into an ambulance assisted by a policeman and a bystander.

With this evidence of the general use and value of the modern traction splints for the upper and lower extremity fractures the Committee on Fractures feels that the time has arrived to recommend the passage of an ordinance in all cities of the state such as was passed in the City of Crookston, Minnesota, through the efforts of the late Dr. Arthur Kahala. The ordinance previously published in MINNESOTA MEDICINE for May, 1937, on page 304, is as follows:

AN ORDINANCE REQUIRING AMBULANCES TO BE EQUIPPED WITH FIRST AID AND SPLINT APPLIANCES TO BE APPROVED BY THE BOARD OF HEALTH AND REQUIRING AN ATTENDANT WITH A CERTIFICATE OF FITNESS.

The City Council of the City of Crookston Do Ordain:

Section 1.—No person, firm or corporation shall operate or cause to be operated any ambulance, public or private, or any other vehicle commonly used for the transportation or conveyance of the sick or injured, without having such vehicle equipped with a set of simple first aid and splint appliances approved by the Board of Health and having in attendance at all times such vehicle is in use a person who has obtained a certificate of fitness as an ambulance attendant from the Board of Health.

Section 2.—Any person desiring a certificate as an ambulance attendant shall make application in writing therefore to the Board of Health. Before the issuance of any such certificate the applicant therefore must present evidence of his qualifications to fill such position and must demonstrate to the satisfaction of the Board of Health his ability to render emergency first aid and to apply approved splints to arm and leg fractures.

Section 3.—Any person violating the provisions of this ordinance shall upon conviction thereof be punished by a fine of not to exceed One Hundred and no/100ths ($100.00) Dollars or by imprisonment for not more than ninety (90) days.

Section 4.—This ordinance shall be in force and effect from and after its passage, approval, publication and record.

This ordinance does not specify any particular special splint. It allows for any improvement which may be made as time goes on and allows the Board of Health of the community to specify the splints to be used. The local members of the State Fracture Committee can work with the Board of Health, and undoubtedly only modern splints and methods will be approved. Such a regulation should serve as a protection to the citizen of each community throughout Minnesota.

It seems generally agreed that the Army type traction splints should be used for simple fractures of the long bones for first aid and transportation. The committee has found some opposition to the use of traction splints for first aid and transportation in compound fractures because contaminated bone will be occasionally brought back into the wound, and we wish to discuss this point.

There is, of course, a difference between contaminated wounds and infected wounds. All compound fractures should be considered as contaminated, and they may become infected. The infection begins in the soft parts, and it is therefore important to protect the soft parts. If one end of the bone is outside the wound, the other end is usually in the wound. The wound is contaminated, and if the splinting is inadequate the end of the bone on the inside is damaging the soft tissues and preparing the contaminated tissue for the later infection.

For practical purposes compound fractures may be divided into three groups. There is the group where a foreign body

penetrates the tissues and produces a fracture. This wound is contaminated, and without adequate splinting the tissues will be further damaged, the contamination will be spread about, and it becomes increasingly difficult to prevent infection.

In a second group which is more common in civil life a fractured bone will penetrate the skin and be immediately drawn back into the wound. This wound is contaminated, and failure to apply traction splints will similarly increase the damage to the soft parts and increase the chance of infection.

In a third group which is usually the smallest group, one end of the fractured bone will be sticking out of the wound and will be dirty. The wound will be contaminated and the other end of the bone will be inside ready to damage the soft parts, if the splinting is inadequate, and spread the contamination. To apply a traction splint will result in bringing the dirty bone back into the already contaminated wound, but the damage to the soft parts will be minimized, and the wound will be in better shape for the surgeon when the patient gets to the operating room. From the standpoint of the greatest good to the greatest number, we believe that the use of the Keller-Blake hinged half ring splints for the lower extremity and the Murray-Jones hinged ring splints for the upper extremity which were introduced in 1916 in World War I and which have been in use for twenty-five years and are now being used in World War II, should be carried on every civilian ambulance and that the ambulance attendants should be able to properly apply these splints.

At this point and in connection with the treatment of compound fractures it might be well to include a resolution which was presented by Dr. William O'Neill Sherman at the January, 1941 meeting of the Committee on Fractures and Other Traumas of the American College of Surgeons and which reads as follows:

> Resolved: That it is the consensus of this Committee that the use of snug-fitting plaster encasements in the initial treatment of acute compound fractures is inadvisable except where the case can be closely and continuously observed.
>
> That early splinting, utilizing fixed traction, should be followed by adequate debridement at the earliest possible time; that such debridement should accomplish removal of all dead and devitalized tissue, eliminating all dead spaces and removing all foreign material.
>
> If chemical sterilization is feasible, the use of aqueous sodium hypochlorite is advised.
>
> That the immediate closure of compound fractures is inadvisable.

The committee decided at its meeting held March 12, 1941, that for this year all efforts as a committee should be directed toward educating the public in the use of the Army type First Aid and Transportation Traction Splints. The movie films owned by the Minnesota State Medical Association should first be shown in each county medical society and before hospital staff organizations and other interested medical societies.

The local ambulance organizations, public and private, and undertakers who operate ambulances should be given demonstrations with the moving pictures and with actual splints.

Hospitals should be urged to keep the standardized splints on hand for exchange when splinted patients are brought in on ambulances.

Doctors should be urged to keep standard splints in their offices or automobiles ready for emergency use.

Nurses' organizations, Red Cross groups, Boy Scouts, Girl Scouts, first aid groups and safety groups in industrial organizations should be shown the first aid movies and given demonstrations in the application of the Army type traction splints for first aid and transportation of fractures of the upper and lower extremities.

In a letter to the writer from Sir Ernest W. Hey Groves of England he discussed this problem succinctly as follows: "The attempt to get fracture treatment better organized is meeting with verbal encouragement but great practical opposition; the latter is chiefly of a negative character, the 'vis inertia' which confronts all efforts at reform."

We believe that the fracture committee of the Minnesota State Medical Association is overcoming this "vis inertia" and is making real progress and improvement throughout the State.

Roscoe E. Webb, M.D., *Chairman*

COMMITTEE ON INDUSTRIAL HEALTH

This Committee has been feeling its way along attempting to become well informed on the real functions and the work which may be accomplished by it. Dr. L. S. Arling of Minneapolis, Vice Chairman, represented the group at the annual Industrial Health Conference in Chicago. Present indications are that the Committee will be called upon to coördinate certain activities in connection with national defense. So far we lack specific instructions.

Unfortunately, the $10,000 appropriation requested to further the work of Doctor Fokker's division in the Department of Health failed to pass the recent session of the State Legislature. It is our hope that some way will be found to carry on the work. The Committee will help further a careful study concerning occupational diseases during the next two years so that definite recommendations for changes in the State Workman's Compensation Law may be made at the next session of the Legislature if found advisable.

J. Lawrence McLeod, M.D., *Chairman*

COMMITTEE TO STUDY MOTOR VEHICLE ACCIDENTS

The Committee to Study Motor Vehicle Accidents has continued during the past year to follow closely the developments in tests for alcohol in motorists involved in accidents. Material on the subject has been collected looking to the eventual recommendation of standards of methods to police authorities.

Due to conflicting reports on results of tests used elsewhere, as well as to other pertinent considerations, it seemed unwise to make such recommendations last year and the situation has not greatly changed. The committee will work closely with the Minnesota Safety Council and other interested agencies in the eventual solution of this problem.

J. C. Hultkrans, M.D., *Chairman*

COMMITTEE TO STUDY PSYCHOPATHIC PERSONALITIES

A meeting was held in conjunction with the Committee appointed by the State Bar Association to Study Psychopathic Personalities, in the office of the Attorney General at the State Capitol on January 16, 1941.

After considerable discussion the following report was drafted and submitted to Governor Stassen.

"Your committee, in accordance with the request of the Legislature, has completed its consideration of the Laws of 1939, Chapter 369, relating to psychopathic personalities.

"As of November, 1940, fifty-three persons had been committed as psychopathic personalities; of this number two have been discharged, six paroled, three escaped, one transferred to the Veterans' Hospital at St. Cloud and forty-one in State Institutions.

"After considerable discussion it was determined by this committee that no changes in the definition as used by Chapter 369 should be made at this time. Though the definition is not altogether satisfactory, it has been determined by both the State Supreme Court and United States Supreme Court to meet constitutional requirements and in view of the courts' interpretation it was felt that any change at this time might merely add confusion to necessarily complicated concepts.

"Your committee respectfully submits the following recommendations:

"1. Section 8992-177 should be amended so as to provide that the two duly licensed doctors of medicine appointed by the court to assist in the examination of the patient should receive a fee for their services in such amount as the appointing judge shall determine. The determination of the existence in a person of a psychopathic personality is a matter of considerable difficulty and which requires skilled assistance by physicians. The records show that a great number of these hearings consume an entire day or longer. Under section 8992-177 the doctor of medicine assisting the examiner may be paid but $5.00. In so far as much of the success of this law will depend upon the caliber of medical assistance furnished to the court, it is our recommendation that the judge determine the amount of fees to be paid the physicians. Such an amendment would permit the adjustment of the fees so as to accord with the amount of time consumed and the difficulty of the issues involved.

"2. Minnesota Statutes pertaining to the commitment of all persons mentally deficient or defective should be revised. Much of the difficulty involved with the administration of commitment laws pertaining to the feebleminded, the epileptic, the insane, and the psychopathic personality appears to be caused by the fact that we are requiring courts to make subtle and difficult medical and psychiatric diagnoses. It is felt that the courts should properly consider merely whether because of mental defect or deficiency any individual is in need of care for his benefit or the benefit of society. Whether or not such persons should be properly classified as feebleminded, psychopathic, or some other form of mental abberation should be properly left to the determination of competent physicians and psychiatrists. In so far as specific recommendations effecting such a change would cut across the entire field of mental defects, it was thought to be without the scope of this committee's function. Consequently, we recommend that an interim committee be appointed to study the entire problem of commitment of persons mentally deficient or defective. This would involve codification of laws pertaining to commitments recommending such changes as are necessary to provide adequate psychiatric service to the courts, and such other changes in the laws pertaining to commitments as might be deemed advisable by the committee."

It was suggested also that an interim committee be appointed to study the question of psychopathic personalties.

Gordon R. Kamman, M.D., *Chairman*

INTERPROFESSIONAL RELATIONSHIPS

A meeting was held to consider the problem of supplying nurses to rural hospitals and especially of adjusting standards of nursing education to the rural nursing training schools so as not to deprive rural hospitals and populations of much needed nurses at fees they are able to pay.

Nurses, hospital superintendents and physicians from rural communities met with the committee, discussed nursing standards and the possibility of a law governing activities of the Nurses Examining Board so as to protect the rural hospital. A further meeting was agreed upon in the hope of arriving at a compromise.

R. G. Allison, M.D., *Chairman*

Doctor Hammes: The Reference Committee found that every committee had done an excellent job.

More frequent meetings of the Interprofessional Relationship Committee were suggested, especially during the emergency when there is acute danger of shortage of nurses.

The Reference Committee suggests also that an effort be made to obtain an advance subscription list in order to find out how many members may wish to buy the complete history which is now being printed serially by the Historical Committee in Minnesota Medicine.

The Reference Committee commends the work of the Committee on Military Affairs and members of the House of Delegates are urged to read the excellent report of the Committee on Fractures, and it is suggested that the Editing and Publishing Committee be instructed to publish the recommendations in Minnesota Medicine. Delegates will also watch results of the work of the Committee on Industrial Health with interest.

Attention to the report of the Committee on Motor Vehicle Accidents is recommended also and the Committee suggests that the report of the Committee on Medical Testimony be taken up at the evening session.

Doctor Will then called on the chairmen of the above committees.

Dr. R. G. Allison, chairman of the Interprofessional Relationships Committee: My committee plans to meet further during the present meeting and may have a supplementary report to offer at a future session of the Delegates.

Doctor Piper, chairman, Historical Committee, reviewed the report of his committee and expressed his regret that Dr. J. M. Armstrong, through whose efforts most of the material has been assembled, was not present to speak to the Delegates.

Dr. F. L. Smith, chairman of the Committee on Military Affairs: I should like to call your attention, inasmuch as a good many reserves are going into the Air Corps, to the fact that there has been a change in the regulations recently which permits a man to become a Flight Examiner after only a six weeks' course. To become a Flight Surgeon it is still necessary to have a year's extension course followed by six weeks' training at Randolph Field.

Dr. Gordon Kamman, chairman of the Committee on Psychopathic Personalities: I should like to point out that your committee worked with a committee of the Minnesota State Bar Association on the report presented and that it was submitted and accepted by Governor Stassen. Also that one of the chief difficulties in the whole question of psychopathic personalities is the matter of definition. The question has been raised as to why it was necessary to include in the definition of a psychopathic personality the qualification "dangerous to others." As a matter of fact, we have experienced difficulty in securing the commitment of psychopathic persons not dangerous to others. The trouble is that there was considerable opposition in the judiciary committee of the Senate to the law and it was retained in order to satisfy lawyers and probate judges and extinguish opposition in the Senate where the bill was almost killed. Mr. Kent Vandenburg of the Attorney General's office, who pleaded the cases before the Supreme Court, said that the phrase was not absolutely necessary from a constitutional point of view but felt that it should be continued in the law, in view of the fact that the Michigan law, without it, did not stand up. So far the law has worked well and I am sure the Interim Committee will iron out the few kinks which remain in it, with the Governor's approval.

It was moved, seconded and carried at the recommendation of the Reference Committee that the reports be accepted.

Doctor Will then called for the report of the Reference Committee on Medical Economics, Dr. A. L. Vadheim, chairman.

The following committee reports were reviewed:

COMMITTEE ON MEDICAL ECONOMICS

Attention of the committee as a whole has been directed, principally, to the question of payment for medical expense on some other basis than on that of individual fees for individual service.

Private practice in the old sense continues, of course, and will continue to a greater or less degree. Increasingly, however, medical service is being paid for either out of taxes or by coöperative effort, and public interest appears to be mounting in the budget plan or insurance method of paying for sickness and accident care. People are asking why it should not be possible to insure thus against medical fees when other types of unusual catastrophe such as death, fire and automobile accidents are met by workable insurance plans.

Theoretically, there seems to be no good reason why such plans should not be feasible and, in point of fact, the medical profession has never raised objection to insurance to aid people in paying for medical expenses. Objection has been raised, however, to groups who undertake to serve a community independently of organized medicine.

There is no ethical or theoretical objection to such plans when they are promoted by units of organized medicine and an attempt is made to safeguard fundamental principles of good medical practice. In fact, a considerable number of medical societies and associations are already experimenting with such plans. Difficulties of various sorts have been encountered in the course of these experiments but sufficient time has not yet elapsed to judge of their success or failure.

In connection with these studies attention of the delegates is called to the article on "Insurance for Expense of Medical Service" by Wendell A. Milliman, Associate Actuary of the Equitable Life Assurance Company of the United States, reprinted in full in the April issue of Minnesota Medicine under auspices of this committee. This article represents the first impartial study ever published by an actuarial expert on this question. Examples of many approaches to the problem are studied in the article, solely on the basis of their actuarial soundness and everybody who is interested, both skeptics and enthusiasts, should read it carefully.

Much valuable work has been done by the sub-committees of the Committee on Medical Economics during the past year, for most of which separate reports are presented. Specific proposals for separate group plans for medical service have been made by the National Youth Administration, and the Farm Security Administration to the Council during the past year and were referred by the Council to the Committee on Low Income and Indigent Problems.

The Committee on Sickness Insurance has had under consideration two separate plans for pre-payment insurance brought to it by units within the state. It is conscientiously fulfilling its function as an advisory body on these problems, actual action being reserved for the county or district medical societies concerned. All sub-committees have worked faithfully and served well in this critical period.

George Earl, M.D., *Chairman*

COMMITTEE ON SICKNESS INSURANCE

Although a great deal of interest exists concerning prepayment plans for sickness insurance, the Committee was agreed at a recent meeting that the State as a whole is not ready to adopt a State plan. However, the Committee is willing to supply all available information to any group desiring to experiment with sickness insurance.

Dr. Adson reported briefly on the Northwest Conference.

Representatives of the Ramsey County Medical Society were asked to present to the committee the plan for prepaid medical service now under consideration for Ramsey County at the meeting and Dr. V. P. Hauser, on behalf of the representatives from the Ramsey County Medical Society, declared that their plan is patterned after the plan of the Minnesota Hospital Service Association. Because of the success of the hospital service plan, they believe that an organization along similar lines could be worked up whereby insurance could be sold to employed groups, preferably the same groups that now hold hospital service certificates or contracts. While proceeding with the details of the plan, they had found first that they should have an Enabling Act so that they would not be forced to operate under the insurance laws. The Ramsey County Committee was of the opinion that the entire matter should be brought before the State Committee on Sickness Insurance with the idea of attempting to have such a bill introduced in the legislature before the end of the session.

The plan had not been presented to the Ramsey County Medical Society as a whole, Doctor Hauser reported, and they could not say whether the Society was in favor of it or not; but it was the feeling of the local committee that they should be prepared with a plan in case the government forced some scheme upon the doctors.

Doctor Sogge, chairman of the Legislative Committee, pointed out that it was now very late to introduce any legislation into the legislature and inasmuch as the Ramsey County Enabling Act was not in proper form for immediate presentation, he felt that it would be practically impossible to get it passed at that session. Doctor Sogge stated further, however, that if application of the Act was limited to Ramsey County, and did not include the entire state, it would have a much better chance of passing.

It was moved that this matter be presented formally to the Council at its meeting the same evening. Doctors Hauser and Bell were delegated to appear before the Council.

The Ramsey County representatives retired and the Committee then discussed a plan formulated by a Minneapolis group for prepaid service which has recently come to light. Doctor Adson stated that this plan also would be considered at the Council meeting that evening.

Doctor Crewe, a member of the Committee, submitted a proposal also, but it was not considered at this time.

The meeting adjourned.

A. W. Adson, M.D., *Chairman*

SUB-COMMITTEE ON LOW INCOME AND INDIGENT PROBLEMS

The average care of the indigent may be divided this year into four groups:

1. Those who are on direct relief. It seems to this Committee that this problem is being handled very well, especially due to the fact that there have been Contact Committees in each county which are in the main doing their duty.

2. The second problem covers the care of the old age pensioner. By our previous plan the pensioner who received additional funds for medical service was required to bring his doctor's receipt back to the Relief Commission before getting his next check. Unfortunately, during the past month the federal government has ruled it is not imperative and this leads us into a rather serious situation as far as the doctor is concerned. The doctor who does his work at a reduced fee should not be obliged to scramble for his money from these assistance clients. At the present time this matter is under consideration by the State Welfare Division, as well as this committee and the State Society. It is hoped that some federal regulation can be made whereby a certain definite amount per client on old age pension can be set aside and placed in a common fund in each county to take care of all medical expenses. The medical expenses will then be paid in the same manner in which they are paid for the patient on direct relief.

3. During the year we have had considerable discussion with the Farm Security Administration officials and the council of the State Society gave permission to the F.S.A. to go into three counties to contact the doctors in these counties and see if they wished to set up some sort of an insurance plan covering F.S.A. clients. These counties were Itasca, Morrison and Ottertail. The doctors in Itasca County, after much consideration, interviewing the patients getting aid from the Farm Security Administration and also contacts with the officials of the F.S.A., decided to turn the proposition down. In Morrison County and Ottertail County favorable contracts have been set up for a trial period of one year to see how the proposition may work out. (A copy of this contract is on file in the Executive Secretary's office.)

4. A program has now been set whereby through a medical officer, as well as a state representative of the N.Y.A., certain groups of N.Y.A. boys and girls are being given a general examination by doctors selected by County Medical Societies. It is hoped by this plan to find the defects that these boys and girls may have. More specific plans will then be instituted to take care of these very decided defects, especially if they are a bar to occupational employment. So far, at the time of this meeting, only the preliminary examinations are being made, and an effort will be made to coöperate with the N.Y.A. as much as possible, at the same time looking after the interests of the medical society.

W. A. Coventry, M.D., *Chairman*

COMMITTEE ON CONTRACT PRACTICE

Of especial interest to this committee and to all physicians in the state was the decision of the Supreme Court denying the appeal brought by the Fraternal Order of Eagles when their action to restrain the Minnesota State Board of Medical Examiners from interfering in the contract between the lodge and a physician hired to provide medical service to members was dismissed in the lower court.

The Supreme Court of Minnesota thus held again, as many other state courts have also held, that a corporation may not legally engage in the practice of medicine through the medium of employing a licensed physician to render medical services to a third person.

A vigorous attempt to change the law was made by representatives of the Order in the last legislature, but the bill failed to pass in either the House or the Senate.

No other instances of infraction or alleged infraction have been referred to the committee for investigation during the past year, though the Committee has followed closely several instances where attempts are being made by various groups to enter into the practice of medicine.

The entire profession of the state must be more alert than usual as medical standards are under siege from all sides.

F. A. Olson, M.D., *Chairman*

SUB-COMMITTEE ON MEDICAL ETHICS

At its last meeting, the House of Delegates approved the suggestion that the name of this committee be changed, that henceforth it be known as the Sub-committee on Medical Ethics and that the number of its members be reduced to three.

Prior to the last annual meeting a letter was sent to the presidents and secretaries of the county medical societies indicating the desire of this committee to assist in the management of any difficulty pertaining to medical ethics which might exist among its members. In the same communication the societies were requested to furnish the committee with information concerning any ethical problems which they had encountered in the past. It was felt that lessons might be learned from known infringements of the ethical code and that information might be properly published without betrayal of individual or group interests.

At the same time an attempt was made to get similar information from the American Medical Association. The inquiries, however, met with little response and it was not considered advisable to pursue the idea further. At this time, when the efforts of the American Medical Association to maintain ethical standards appear to be seriously obstructed, we believe that our efforts should be renewed. Your committee offers assurance of its desire to assist in stabilizing this vital problem.

During the past eighteen months, a number of problems have come to the attention of the committee and we believe they have been handled satisfactorily. The work of this committee, if properly conducted, may assist in the solution of problems which might develop medico-legal phases if permitted to continue. The methods employed by the committee, it is believed, eliminate publicity and consequent embarrassment.

As usual, a course of lectures has been, and will continue, to be given at the University of Minnesota until the program is complete. The type of lectures given by various speakers is carefully selected. If there are any suggestions concerning alterations or adjustments in this program of lectures, the committee will be glad to have them. For your convenience, the titles and dates of the lectures, as well as the names of the speakers, again are published.

April 4. *Opportunities in and Preparation for Practice:* General practice, specialization; industrial medicine; government service; insurance medicine; teaching and research; graduate and postgraduate training. Dr. H. S. Diehl

April 18. *The Management of the Public and Private Patient:* Winning the patient's confidence; the diagnosis; the prognosis; coöperation of the patient in carrying out treatment; the patient's family; his job; his bills for medical and hospital care. Dr. S. M. White

April 25. *The Ethics of the Practice of Medicine:* Responsibility of physicians to their patients and to each other; consultations; fee splitting; relationship to druggists, to nurses, euthenasia. Dr. F. J. Hirschboeck

May 2. *Starting the Practice of Medicine:* Choosing a location; problem of the young practitioner, relationship to other physicians; to hospitals; getting acquainted; determination of fees. Individual and group practice. Partnerships. Dr. J. M. Hayes

May 9. *Medical Licensure:* State and National Boards; Basic Science Boards; reciprocity; Narcotic Licenses; responsibility of Licensure; revocation of license to practice medicine. Dr. A. W. Adson

May 16. *Malpractice:* Definition; justified and unjustified malpractice suits; examples; safeguards against malpractice; malpractice insurance. Dr. B. J. Branton

May 23. *The Physician in Court:* In industrial compensation cases; as an expert witness in criminal suits; in personal injury suits, in malpractice suits. Judge Paul Carrol

June 6. *Medical Care of the Indigent and of Low Income Groups:* Cost of medical care; system of individualistic practice; free and pay clinics; state medicine; health insurance; hospital insurance; attitude of organized medical profession; trends in this country. Dr. R. E. Scammon

June 13. *Quackery, Fads, Cults and Patent Medicines:* Definition and description; reasons for existence; relationship to the practice of medicine and to the public health; attempts at control; borderline types of practice by physicians. W. A. O'Brien

L. A. Buie, M.D., *Chairman*

EDITING AND PUBLISHING COMMITTEE

The year 1940 was another good year for MINNESOTA MEDICINE, from an advertising revenue as well as editorial standpoint. There was the largest number of copies printed, the largest number of pages, the largest number of illustrations and the largest average per issue of any year. The net surplus was one of the largest ever shown in its twenty-three years of publication, a net cash surplus amounting to $1,524.77 as compared to $1,679.32 for last year.

During 1940 there were printed a total of 39,950 copies of the journal, or an average of 3,329 for each month during the year. The total number of pages amounted to 1,268, including the supplement of fifty-two pages published with the January, 1940, issue. Of this number 952 were devoted to reading and 316 to advertising. The reading pages included 128 scientific articles, not including the fifty-two-page supplement but including those presented in the proceedings of the Minnesota Academy of Medicine and the Minneapolis Surgical Society. In addition there were six abstracts of papers published and eleven case reports. This number does not include the case reports appearing in the body of many of the scientific articles. There were 189 illustrations, an average of almost sixteen illustrations per issue, the largest number of cuts that has appeared in any volume since the journal was established twenty-three years ago.

The special section devoted to Medical History of Minnesota and Medical Economics, occupied 77.5 pages and seventy-one pages, respectively, or an average of six and one-half pages per issue. Other special sections included editorials, reports and announcements of societies, news items, book reviews, the yearly roster and minutes of the annual meeting of the Association. There are now approximately 229 pages of standing type matter relating to the Medical History of Minnesota.

During the early part of 1940 arrangements were made for visiting the medical school of the University each month for news items and activities of the school. This has resulted in the publication of many items concerning the medical school that no doubt have been received with a good deal of interest, and we think that the medical school appreciates the service. Special effort has been made to obtain more news items of a personal nature concerning doctors throughout the state. This has resulted in the publication of the largest number of personal items during 1940 that has ever been published in the Journal. This service has been supplied without charge by the Business Manager's office.

At the close of 1940 our records show a total number of paid membership subscriptions of 2,506, with about 130 subscriptions carried the first part of the year as delinquents. There were 205 non-member subscriptions received during the year. Miscellaneous distribution including single copy sales, exchanges, complimentary copies, advertisers' checking copies, which includes the advertising agencies as well as the advertisers, numbered close to 400 copies each issue, leaving a surplus of about 100 copies for the filling of orders for back copies and for sample copies to prospective subscribers and advertisers.

As in 1940, but perhaps more so, the business outlook is extremely uncertain. If our country remains out of war, the larger expenditures for defense are sure to result in greater purchasing power and a possible increase in advertising revenue. However, there are so many things upon which conditions are contingent that one hesitates to make any forecast. If this country becomes involved in the world war, no one knows what the conditions will be.

As we all know, advertising expenditures are largely contingent upon good business conditions. Ordinarily, when volume is up, advertising budgets generally follow suit. With the additional income taxes which have been imposed and, especially, the surplus earnings taxes, some manufacturers may feel disposed to use a portion of surplus earnings for institutional advertising. In such a situation, larger advertising appropriations may be reasonably expected. But, as previously stated, all these things can be so vitally affected by other conditions, that it is not safe to make any estimate as to what the year will bring.

Again we want to call to the attention of the House of Delegates and the Council, that a very substantial volume of advertising has to be declined each year because the products advertised have not been approved by the Council of the American Medical Association. Frequently this advertising will be noted in other publications. It is of course understood that MINNESOTA MEDICINE can carry no advertising except that of products measuring up to A.M.A. standards both in quality and in methods of marketing.

During the year the Publication Committee lost one of its most loyal and efficient members in the untimely death of Dr. C. B. Wright. Dr. Wright was a member of the committee since 1935, and always took an active part in publication matters. His loss will be a severe one to the committee as well as to his family and the medical profession of the state.

It will be recalled that in accordance with the authority of the Council, a special feature was included with the January, 1940, issue of the journal in the publication of a fifty-two-page supplement and of 600 additional copies of the issue. The cost of this supplement was charged against the net cash earnings for 1939.

There has now been entered $2,763.84 to the credit of MINNESOTA MEDICINE in the special fund. This includes the net cash earnings for 1939 and 1940. It is understood that this fund may be used at the discretion of the Editing and Publishing Committee, when such use is approved by the Council.

Herewith is the financial report and the operating report for the year of 1940.

MINNESOTA MEDICINE

CASH RECEIPTS AND DISBURSEMENTS

For the Period January 1, 1940, Through December 31, 1940

SOURCE OF CASH RECEIPTS		
Display Advertising		$10,145.38
Member Subscriptions		4,931.50
Non-member Subscriptions		513.55
Reprint Income		151.58
Bad Accounts Recovered		117.40
		$15,859.41
Less:		
Discounts and Commissions		
Advertising	$1,367.75	
Subscriptions	14.25	1,382.00
		$14,477.41
Cash retained from 1939 Surplus to cover 52-page Special Supplement included in the January, 1940, Issue		440.25
		$14,917.66
CASH DISBURSEMENTS		
Journal Expense		$12,952.64
Cost of 52-page Special Supplement included in the January, 1940, issue		440.25
		$13,392.89
Cash Surplus for Period		$ 1,524.77
Accounts Receivable January 1, 1940		$848.86
Accounts Receivable December 31, 1940		$774.28

STATEMENT OF INCOME AND EXPENSE AND PROFIT AND LOSS

For the Period January 1, 1940, Through December 31, 1940

INCOME	ACCRUAL BASIS	
Display Advertising (Includes $594.16—A.M.A. Dividend)		$10,053.03
Member Subscriptions		4,931.50
Non-member Subscriptions		513.55
Miscellaneous Income		10.17
Reprint Income		160.28
Bad Accounts Recovered (See Schedule A)		117.40
		$15,785.93
Less:		
Bad Accounts Charged Off (See Schedule A)		1.10
		$15,784.83
EXPENSE		
Journal Expense (Includes expense of Special 52-page Supplement) (See Schedule B)		$13,392.89
Discount and Commissions		
Advertising	1,367.75	
Subscriptions	14.25	
		$14,774.89
Profit for Period		$ 1,009.94

SCHEDULE A

BAD ACCOUNTS RECOVERED	
Mudcura Sanitarium	$ 70.00
Sonotone Minnesota Co.	47.40
	$ 117.40
BAD ACCOUNTS CHARGED OFF	
Lucille Fisher	$ 1.10

SCHEDULE B

Printing Expense—includes composition, presswork and bindery expense	$ 6,431.55
Paper Stock	1,591.73
Illustrations	436.21
Dr. Carl B. Drake—Editorial Fee	1,200.00
Second Class Postage and postage used on Minneapolis and Foreign copies	429.85
Mailing Envelopes (Used for January, 1940, Issue)	36.00
Bruce Publishing Company Service fee (Covers business management, stenographic service, mechanical editing of all material, ordering all cuts, making up dummy, mailing out all proofs, bookkeeping, billing and collecting all accounts, keeping up mailing list, etc.)	1,680.00
Bruce Publishing Company (Covers telephone, telegrams, addressograph plates, etc.)	132.00
Advertising Commissions (Includes 5% received from advertising placed thru CMAB)	1,260.33

1940 Copyright Fee	24.00
Insurance Bond—J. R. Bruce, Bus. Mgr.	5.00
Exchange on checks	9.27
Stationery	24.45
Subscription solicitation letter in connection with January, 1940, Special Issue	50.25
Advertising solicitation letter	3.70
L. C. Smith Typewriter	63.55
A.M.A. Directory	15.00
	$13,392.89

E. M. Hammes, M.D., *Chairman*

MEDICAL ADVISORY COMMITTEE

The Medical Advisory Committee has held no meetings this year. There has been nothing urgent enough to require the calling of a meeting, and the activities of this Committee have been purely advisory.

The Committee has received and scrutinized notifications and memoranda relative to a number of malpractice suits which have been threatened or actually instituted against some members of the Association in various parts of the State. In addition the Committee has, in several instances, conferred informally with representatives of insurers of physicians threatened or faced with malpractice suits. In addition, an effort has been made to continue the educational program, instituted by the Committee some years ago, in the form of editorials monthly in Minnesota Medicine.

W. H. Hengstler, M.D., *Chairman*

COMMITTEE ON INDUSTRIAL RELATIONS

One of the most important decisions ever handed down by the State Supreme Court in the field of industrial relations was issued May 3, 1940. This decision reversed action taken by the Industrial Commission in denying payment of medical fees for services of the physician-of-choice of a St. Paul fireman injured in line of duty. The decision ended a long dispute between the Ramsey County Medical Society and city employes and the St. Paul city government and definitely settled for the future the question of whether or not an injured workman has a right, under the Workman's Compensation law, to payment of medical fees to the physician of his own choice. Great credit is due the city employes' union of St. Paul, which successfully carried the appeal to the high court. Briefs were filed, as friends of the court, by the Minnesota State Federation of Labor and the Minnesota State Medical Association.

Letters are now being sent to all injured employes informing them of their rights in this matter.

No other special problems have come within the purview of the committee during the year.

Stephen H. Baxter, M.D., *Chairman*

Doctor Will then called upon the chairmen of the Medical Economics Committee and its sub-committees for additional remarks.

Dr. George Earl, chairman of the Medical Economics Committee: As the delegates know, the Medical Economics Committee is composed of several subcommittees all of which have excellent personnel. All have chairmen who are no John Aldens and are well able to speak for themselves and their work. You know how good their work has been.

I want only to leave this thought with you—I am quoting from Governor Stassen in a recent radio address: "I feel that this is a good example of an effort to meet a problem through private enterprise with just a minimum of government coöperation," Governor Stassen said. He was speaking about the group hospital service but he has applied the same thought often to medical problems. "It works out much better than to have the government take over the problem and add another government bureau and spend a lot more government funds. In the long run, our success in working out methods of this kind will determine just how effective our democratic form of government can be in the face of changing industrial and economic and social conditions. We should always be searching for better ways of meeting our problems through the initiative of the people, with the government simply helping the people to help themselves. In practice, the idea of a government as an agency of the people as a whole to help the people to help themselves is at the very foundation of democratic government. Other types of government start out with the idea that they want to take over and do everything for the people. Soon the people find this results in the people being told what they must do by the government and soon every phase of their lives and freedom and liberty are gone."

I recognize, of course, that in a war emergency things are different; but Stassen was not thinking of war emergencies; he was thinking of past tendencies and of future tendencies. I think that the Governor's statement, though from a layman, explains the essential purpose of the Medical Economics Committee. I am sure the chairmen who have done all the work have something to add.

Dr. E. M. Hammes, chairman of the Editing and Publishing Committee: I should like to point out that Minnesota Medicine has had its best year, this, year, from a scientific viewpoint and also from an economic viewpoint in spite of the war situation.

Dr. W. A. Coventry, chairman of the Committee on Low Income and Indigent Problems: Caring for old age pensioners has been a problem ever since the beginning of the Social Security program. As you know, the government has ruled that they could not refuse to pay allowances for medical service if the patient did not have a receipt from his doctor. The thing is being threshed out now and the solution may be a separate fund, set up somewhere, between the county, state and federal governments, to take care of costs of medical services to these recipients of old age relief. If it can be worked out, it may solve many problems of all of us.

Dr. A. W. Adson, chairman of the Committee on Sickness Insurance: We have listened to many plans for sickness insurance, reviewed many plans now being employed in other states. The committee as a whole feels that the state organization should not become involved in development of a state plan. We are willing to coöperate and to provide information from our files for anybody who is interested in working out a sound system. We are not ready as a committee to advise any plan for Minnesota.

Dr. F. A. Olson, chairman of the Committee on Contract Practice: I would like to warn the House of Delegates about the varieties of group medicine and contract medicine that are springing up in all parts of the country. They require watching.

It was moved, seconded, and carried that the recommendations of the Reference Committee on Medical Economics reports be accepted.

Doctor Will then called for the report of the Reference Committee on Medical Education reports, Dr. R. R. Cranmer, chairman. The following reports were covered.

COMMITTEE ON HOSPITALS AND MEDICAL EDUCATION

Working in conjunction with the Minnesota Hospital Association and the State Department of Health over a period of more than a year, your committee begs to report that there has finally evolved a bill for the control by licensing of convalescent homes, rest homes, and other institutions caring for the sick in the state of Minnesota. It is hoped that this bill will be passed by the present State Legislature with your backing and that it will eventually correct the irregularities in the care of the sick so well known to physicians.

A review of various factors surrounding county medical society meetings of our state is being planned. With this and other information it is hoped that an article will be forthcoming with an aim at setting forth basic rules and principles leading to successful county society medical meetings.

A. H. Wells, M.D., *Chairman*

COMMITTEE ON PUBLIC HEALTH NURSING

The most important matter brought before the committee this year was the revision and elaboration of the "Suggested Polices and Standing Orders for Public Health Nurses." These suggested regulations are presented as standards by which political organizations employing public health nurses may guide them-

selves in setting up the standing orders and policies of such services. These were adopted by the state organization for public health nursing, the public health nursing division of the State Board of Health, and approved by your Council during the past year.

Discussion was had among the committee members on the need of producing a similar outline of standing orders and policies for nurses in industry, but it was thought that the time was not ripe for this move and it is held in abeyance until such time as there shall be more demand for it.

The bill for state aid for public health nursing in counties was submitted to the committee for study. Copies of the proposed bill were sent to the members for their comment and discussion. With some slight changes by members of the committee, the proposed bill was sent to your Council for approval, after it had received the approval of the State Board of Health and the state organization for public health nursing. The bill did not pass in the Legislature.

C. A. Scherer, M.D., *Chairman*

COMMITTEE ON SYPHILIS

The syphilis committee in coöperation with the committee appointed by the President of the State Board of Health have undertaken during the past year a serological survey in cooperation with some laboratories in the state. Specimens of blood were collected from known syphilitics and known nonsyphilitics and distributed through the efforts of the State Health Department to the various laboratories involved in the undertaking. Each laboratory accordingly examined each specimen of blood within forty-eight hours after it was drawn.

There were nineteen of the twenty-eight laboratories in the state doing serologic work, participating in this study. A total of forty-four test performances as conducted in the nineteen different laboratories were included; eleven of these were complement fixation tests while thirty-three were flocculation tests. There were ninety-nine patients with syphilis which included at least eight varieties of the disease. Most of the syphilitics had been treated for more than one year. There were likewise ninety-nine non-syphilitics. The plan of collecting the blood and its distribution was carried out by the State Board of Health and by the collaborating laboratories; it was adopted from the plan established by The Serologic Committee in conjunction with the United States Public Health Service.

It was obvious from the study that some of the laboratories were in need of improving their technique and as a result of this checking, many of the participating laboratories have clearly indicated their interest and efforts in improving their tests. The complete report will be published in more detail in Minnesota Medicine. A similar study for the year 1941 is now under way in which thirty-two laboratories, including the State Department of Health, are participating. No pooled sera are employed as was done last year; all specimens to be tested this year will be of whole blood from known syphilitics, known normals, or individuals available for further study in event of any question as to diagnosis.

It is the belief of this committee that the continuation of such studies and the informal interchecking will be mutually beneficial to all laboratories participating in them.

Paul A. O'Leary, M.D., *Chairman*

REPORT OF THE COMMITTEE ON CANCER

Much of the work of the Committee on Cancer has been advisory to the Women's Field Army. Incorporation of the women's organization as the Women's Field Army of the Minnesota Society for the Prevention of Cancer was completed during the past year.

Nothing is done, either in carrying forward the education program against cancer or in organization work, without medical advice and the organization as constituted affords to the medical profession an effective instrument for authoritative and legitimate cancer education.

Headquarters for the newly incorporated association were moved during the past year to 481 Lowry Medical Arts Building in St. Paul. Space was made available without rental charge in the Medical Arts building through the courtesy of the building management at the request of the chairman of this committee. In this more central location, the work of the membership campaign, final results of which are not yet available, was more conveniently carried forward. In addition, the Field Army was able to secure the aid of the state medical association office in securing speakers during the campaign and otherwise.

The committee coöperated with the Committee in charge of the Subject-of-the-Month program in selection of material for the cancer packet distributed in April. For the cancer packet this year special emphasis was placed upon cancer of the uterus and stress was laid publicly upon the need for routine examinations after forty to catch and give early treatment for cancer of the uterus.

M. W. Alberts, M.D., *Chairman*

COMMITTEE ON CHILD HEALTH

At the first meeting on January 10, 1941, the objectives of the committee were stated as follows: (1) to consider all matters pertaining to improvement of the health of infants and children in the State of Minnesota, and (2) to formulate recommendations to the officers of the Minnesota State Medical Association regarding such matters.

A thorough discussion was carried out on the subject of the course in pediatrics which was to be presented at the Center for Continuation Study to representatives of county and district medical societies and financed by the State Board of Health with federal funds. The course was outlined by W. A. O'Brien and the manner of arrangements for selection of participants was explained by V. Wilson, Director of the Division of Child Hygiene of the State Board of Health. It was agreed that the course presented in 1940 had been highly successful. However, greater efforts were to be made to have the material carried to the various medical societies by the representatives so that the effects of the teaching would be made as general as possible.

It was recognized that the greatest opportunity for decreasing infant morbidity and mortality is now in the field of prematurity. For this reason, greatest stress in the course is to be placed upon this phase. At the present time, it is difficult or even impossible to evaluate the results of the current program for premature infant care sponsored by the State Board of Health and of the work of Miss Carlsrud who is making visits to all hospitals and to as many physicians as possible in connection with the instructional side of this program. Certain facts were emphasized. There is no adequate knowledge of the premature problem in the state. There is a great lack of information concerning the causes of death of premature as well as of mature infants, which is due in part to the probably very low percentage of postmortem examinations done on this group of patients. Proper consultation service for the care of premature and newborn infants may be wanting in a great part of the state. An experimental project might be set up in one county under the sponsorship of the Committee to investigate and secure postmortem examination of each infant who dies, and to provide proper consultation service and anything else which might result in more intelligent handling of the problem throughout the state. It is hoped that the aid of those attending the Continuation Course can be obtained to emphasize the necessity for better practice in the respective communities by bringing to the society members the monthly mortality reports from the State Board of Health, by carrying out postmortem examinations and investigation of the causes of death of infants and by urging proper measures to cut down the mortality rate. It appeared that this Committee is in a most strategic position to be of help in this program.

The distribution of an Immunization Card to each mother before she leaves the hospital with her newborn infant was discussed. Tentative approval of the committee was given to the distribution of such a card which will serve as a reminder that certain immunization procedures are desirable and on which such procedures can be recorded. The State Board of Health is to coöperate in the publication and distribution of these cards.

The Committee discussed the Follow-up Committees which are to be organized in all states to carry on the work of White House Conference on Child Welfare. Names of the Minnesota Committee are to be drawn up by Dr. Helmholz and Dr. Hilleboe, Medical Coördinator of the Social Welfare Division, to be presented for appointment by the Governor.

The Committee went on record as recommending the Public Welfare proposals incorporated in the Governor's speech before the Legislature, and particularly of the Governor's housing program.

It was suggested that the coöperation of the American Legion might properly be accepted in urging a general showing of the film, "Bobby Goes to School," released through a commercial firm and made under the direction of the American Academy of Pediatrics. The film is shown only with the express approval of local medical societies.

Facilities for the institutional care of psychotic and prepsychotic children were discussed. Extensive changes in present facilities and laws will be necessary to correct the present undesirable conditions. It was felt that this subject is so important and of such proportions as to merit separate consideration at some future meeting of the Committee. The Committee went on record as favoring the segregation for treatment of psychotic and prepsychotic children committed to state institutions in one ward of one institution and recommended that this action be forwarded to proper officials.

In order to maintain a working committee the chairman recommends to the President that appointments to this committee be made to fill the places vacated by Dr. C. W. Rumpf, who it is understood has left practice for work in the army and by Dr. C. A. Stewart, who has accepted the chair of pediatrics at University of Louisiana.

Roger L. J. Kennedy, M.D., *Chairman*

COMMITTEE ON VACCINATION AND IMMUNIZATION

Marked and heartening progress has been made during the past year in the work of protecting the children of Minnesota against smallpox and diphtheria.

As a result of the concerted state-wide campaign undertaken by the Committee on Vaccination and Immunization with the enthusiastic backing of the Council, more toxoid and vaccine have been distributed in 1940 and 41 through the State Board of Health than in any other like period. Medically sponsored immunization programs were begun in many communities where such community measures had been altogether lacking or only sporadic or without the backing of the local medical profession

before. A total of thirty-five counties, exclusive of the big cities, have carried on such programs in the state since January 1, 1941.

For many years, a lack of information about plans and experiences in other parts of the state has been felt by local medical bodies who were casting about for methods to go to work. Specific data on methods of organization and procedure has been lacking and the first step of the committee was to prepare, with the full coöperation of the State Board of Health, a complete packet of material which should provide definite information as to different types of plans already tried with success in various parts of the state, together with a general outline, specimen organization letters, records, etc., and the latest authoritative manual on vaccination from the United States Public Health Service together with comparable instruction on diphtheria immunization. Three alternative plans were outlined for guidance of medical societies undertaking such programs. These societies were specifically informed at the same time that they were entirely free to determine their own plans and to work out plans quite different from any of the three if they so wished. A total of 539 of these packets has been sent out to county officers, county contact committees, public health nurses and any others on request. The thanks of the committee are due the State Board of Health for their assistance in preparing the material.

Because many counties lack public health nurses and physicians sometimes find it difficult to organize a community campaign without the assistance of a public health nurse, the Board has also made available a qualified nurse to aid in these cmpaigns upon request of these physicians.

To date, this service has been requested as follows: Becker County, May 5 to 17; Clay County, May 15 to 30; Dodge and Todd Counties for both of which arrangements are being made; Lyon County where special arrangements were made with the Tracy School nurse.

It is interesting to note, in connection with the centenary of the coming of the first physician to Minnesota, that smallpox was prevalent in the early days of the Minnesota territory and that one of the first laboratories for the manufacture of vaccine in the entire country was established by Dr. Charles N. Hewitt, first secretary and executive officer of the newly organized State Board of Health in 1872. Physicians and health officers today are still struggling to extend the protection of vaccination to every baby in the state and until this goal is achieved there will still be unnecessary cases and deaths from the disease in Minnesota.

Diphtheria likewise will be completely wiped out as soon as all babies under a year old are immunized. It is the duty and responsibility of physicians as leaders in all sound public health measures in the community to take the initiative in bringing this practical and attainable millenium to pass in Minnesota.

L. R. Critchfield, M.D., *Chairman*

COMMITTEE ON OPHTHALMOLOGY

The only matter coming before the Committee on Ophthalmology pertained to unethical advertising by an optical company for a private practitioner.

The House of Vision, a Chicago optical company, with a branch in Minneapolis, had sent printed matter to patients of a licensed practitioner in western Minnesota. This printed matter was in the form of a questionnaire. It also urged people to consult an M.D. for eye examinations and then went on to name this particular doctor whom they should consult in their locality.

Inasmuch as this constituted unethical advertising, the Committee felt that the matter should immediately be called to the attention of the parties involved by the Secretary of the Minnesota State Medical Association.

T. R. Fritsche, M.D., *Chairman*

Doctor Cranmer: The Reference Committee recommends approval of all the reports on Hospital and Medical Education. They wish to call attention of the delegates to the fact that the bill providing for licensing of rest homes passed the Legislature since this report was prepared and we feel that it is a very fine bill indeed. Those of us who live in the large cities, particularly, realize what kinds of institutions these rest homes are. It is especially fortunate that the bill puts licensing of these homes into the hands of the State Board of Health, together with control of already existing institutions.

The subject of compulsory premarital examinations was discussed by the committee in connection with the report of the Committee on Syphilis and Social Diseases. We understand from Doctor Sogge that a bill providing for such examinations has been prepared but never presented for passage in Minnesota. Several other states, including Iowa, have passed such bills and it seems to me desirable that we should consider such action here.

Doctor Will then called for further remarks by committee chairmen.

Dr. Francis Lynch, representing Dr. Paul O'Leary, chairman of the Committee on Syphilis and Social Diseases: The matter of compulsory premarital examinations has been discussed by the committee but no formal action was taken because it was the general feeling that we were not quite ready to recommend such legislation. The principles are excellent. The difficulties are technical, in that many of the states which hastily passed such laws have run into trouble in the wording of the law. For instance, the wording has brought up the question: Shall the law read that an individual with a positive Wassermann shall not be allowed to marry? Must he be approved by his local physician? Must there be a committee to approve marriage for such individuals and what tests shall be accepted? That is, shall a Wassermann be enough or shall we have other tests? And what laboratories shall be accepted? It was the feeling of the committee that the first step is to raise the standard of all serological studies in the state in the smaller laboratories before going into any legislation of that type. We feel, just as Doctor Cranmer said, that the principle is just and that the requirements will eventually be met for Minnesota.

Dr. L. R. Critchfield, chairman of the Committee on Vaccination and Immunization: We want to express our gratitude to the State Board of Health for their coöperation in the program of our committee. They have supplied us with information, inspiration and material. Thirty-five counties, as you know if you have read the report, are now carrying on vaccination and immunization programs—a good deal less than half the counties in the state. The objectives of this program can be achieved only by the activity of the local physician in his own community and of the local county and district societies. We must not halt in our efforts until all children in the state have been given the opportunity to be protected from smallpox and diphtheria.

It was moved, seconded and carried that report of the Reference Committee on Medical Education reports be accepted.

Doctor Will then called for the report of the Reference Committee on reports of Officers and Councilors, Dr. R. M. Burns, chairman.

Following are the reports:

SECRETARY AND EXECUTIVE SECRETARY

Medical defense in all of its aspects has occupied a major portion of the attention and time of the State Office staff during the past year and has constituted one of its most difficult problems.

The call to aid in the National Preparedness Program first presented itself in the American Medical Association questionnaire sent to every physician from AMA Headquarters. It became the responsibility of the Committee on Military Affairs and the State Office to see that complete returns were made on the questionnaires. As a result of the efforts of both, and also of the response of the membership, Minnesota took high ranking almost at once among the states of the Seventh Corps Area for the promptness and completeness of its return.

Following close upon the questionnaire came the draft and the request from the Governor for nominations from county medical societies from which to select draft board examiners. Also the request for nominations to Medical Advisory Boards and Induction Boards and for aid in all the complicated machinery of examinations for men inducted into military service.

The majority of the men thus selected have served and are serving without recompense of any kind except the satisfaction of a service well done. The high quality of their service, as shown by the low percentage of rejections by Induction Boards, and their willingness to serve have written another new and worthy chapter in the annals of military medicine in Minnesota.

Problems of Reserve Officers

More difficult of solution has been the problem presented by the call to active duty of more than 150 medical reserve officers. Many of them were from communities where they could ill be spared. Others were from communities where there was no other physician and it was necessary to take immediate action to protect the civilian population.

To aid in meeting the situation, a plan for a "pool" of physicians willing to substitute for men called to service was proposed by the Committee on Military Affairs and approved by the Council on December 15. To put this plan into effect an appeal was sent to every physician, to every intern and resident in the state and even to men who had retired from active practice, to send their names at once to the state office if they could substitute in any way for men called to active military duty. At the same time, our Attorney, Mr. Brist, drew up, at the instruction of the Council, a specimen contract designed to protect the interests of the physician who was leaving his practice and the man who was taking his place. The number of volunteers was small and far from adequate; but real assistance has been given in a large number of instances. In other instances where a serious injustice was being done, both to physicians and their communities, all possible influence has been brought to bear to secure deferment until substitutes can be found. Manifestly the State Association cannot intercede officially except in extreme cases. It has done everything possible, however, to mitigate the unhappy results of the abrupt, and often unwarranted, removal of so many young physicians. It has also sought to inform medical officers of their right under the law, if they are below the grade of captain, to resign from the service if they have dependents and heavy responsibilities at home.

To Safeguard The Future

The problem of safeguarding the supply of physicians in the future has caused grave concern to all medical leaders and educational authorities. Regulations just issued by Brig. Gen. Lewis B. Hershey, deputy director of the Selective Service System, indicate, however, that there is now an official realization of the danger of a national shortage of doctors. State and local draft boards were instructed early this month to defer all medical students who give "reasonable promise of becoming acceptable medical doctors." Interns were urged to apply for reserve commissions to secure a year's deferment and avoid induction into the service.

Medical Relief

Experience of the past year has amply demonstrated the soundness of Minnesota's plan for medical care to relief and social security clients.

County Medical Advisory Committees are well established in all parts of the state and working closely with local county welfare boards and they have the advice and assistance of the State Medical Advisory Committee which, in turn, meets regularly with the responsible heads of the Division of Social Welfare. Long standing sources of difficulty such as medical care for recipients of old age assistance, and the other aids are rapidly being adjusted. New regulations involving medical services are issued only after consultation with the Committee and the Committee, in turn, hears and aids in adjusting all difficulties referred to it through the Division and through the local committees in administration of medical services.

It was particularly interesting to those who attended this year's Conference on Medical Service in Chicago, to note that Minnesota stands way out in front for the smoothness and general efficiency of its machinery for medical relief.

Immunization Campaign

The Association has taken a significant stride forward, also, in other branches of public service this year. Its immunization and vaccination campaign initiated at the behest of the Council under the sponsorship of Committee on Immunization and Vaccination, has given an important impetus to the task of protecting Minnesota children from smallpox and diphtheria.

The campaign was materially assisted by the offer of the State Board of Health to put a nurse at the disposal, as far as possible, of the medically sponsored community campaigns where assistance of a nurse was needed.

Meeker County Plan

It was during this year, also, that plans for the Meeker County Tuberculosis Control Program took shape under sponsorship of the Committee on Tuberculosis. For this program, which takes its cue from the eradication of cattle tuberculosis by the veterinarians, the Council appropriated a fund to cover administrative expense and Meeker County physicians have agreed to contribute their services without charge. The plan calls for routine universal tuberculin testing of all Meeker County inhabitants and with x-ray for reactors to the test. It is hoped that this experiment, first of its kind in the world, may lead to similar programs in other counties and the eventual eradication of human tuberculosis in Minnesota. It is being watched with interest by the public health authoriites everywhere and may well be the first step toward a nation-wide program of tuberculosis control.

Expert Testimony

Another significant departure in the program of the Association began in 1940 with the formation of the Committee on Medical Testimony. In consultation with the Judicial Council of the state and the Minnesota State Bar Association, this Committee brought to the Council a plan for investigation and discipline of physicians judged to have deviated deliberately from the truth when testifying as experts. This plan, first of its kind ever undertaken by a medical body, calls for careful investigation of any case submitted to it and provides that findings be turned over to the State Board of Medical Examiners for discipline of physicians thus found guilty by the Committee. A letter was sent to all judges of the District Court of Minnesota inviting them to submit suspicious cases to the Committee for investigation and the plan received front-page publicity in the newspapers. Cordial and appreciative responses were received and a large number of judges and legal authorities everywhere are looking to the Minnesota plan as the first practical step by physicians in the country to deal with the problem of dishonest testimony.

Subject-of-the-Month Program

The so-called Subject-of-the-Month Program which had its inception two years ago has taken its place as one of the most popular and significant phases of the Association's educational program. Requests for the packet have steadily increased until an average of 500 packets are now sent out from the state office each month, under the auspices of the Committee on Public Health Education. Thanks of the Committee and the Association are due the Department of Postgraduate Education of the University of Minnesota, the State Board of Health and many individual members who have aided in preparing the interesting and important material in these packets. This program, also, is unique among the medical organizations of the country and has earned the commendations of many national educational authorities.

Radio-News Service

The regular educational services of the Association have continued as formerly, including the weekly radio broadcasts by Dr. W. A. O'Brien over WCCO, WLB and KDAL and the weekly news service to Minnesota rural papers. Both of these have directed their efforts toward various phases of the subject-of-the-month program with the obvious advantage that comes from a unified and directed effort.

In addition, the offer made each month, to provide speakers for any interested organization has met with surprising response and speakers have been booked in many parts of the state for PTA, Women's Clubs, luncheon and church groups.

College Lectures

Subjects offered for the regular College Lecture Course of the Association were based upon returns to a questionnaire sent by University investigators to recent graduates in which the latter were asked to name subjects about which they desired more information. Two lectures during the year were offered to each college and 26 lectures were booked in the state.

Legislative Session

This is the end of a legislative year, and the Committee on Public Policy, especially its chairman, Dr. L. L. Sogge and our Attorney, F. Manley Brist, have watched proceedings of the legislature closely and with complete success, as always, to protect the interests of medicine and the public health. The State Office has placed all of its facilities at the disposal of Dr. Sogge for this essential work.

Finances

The finances of the Association as indicated in detail in the report of the treasurer are in excellent condition. At the end of 1940, there was a surplus in the treasury of $8,619.84, of which $6,000.00 was turned over to the Permanent Investment Fund by order of the Council. Each annual meeting since 1937 has paid for itself and shown a profit to the Association and this great St. Paul meeting will be no exception though complete figures for expenses are not yet available. A profit, after all expenses were paid, of $3,451.68 was turned over to the treasury as a result of the Rochester meeting.

New Delegate

Membership in the Association has grown steadily to a figure which now entitles the Association to an additional delegate to the American Medical Association, according to an official notification of Dr. Olin West, Secretary and General Manager of the Association. A fourth delegate and alternate will accordingly be elected at this session.

Crisis

Medical organization in this country has reached a crisis in its public relations as a direct result of the decision against the American Medical Association in Washington. No matter what the eventual outcome of the appeal in that case may be, the integrity and ideals of the Association and of all medical organization is already being questioned and our good name is attacked in many quarters. This reaction was felt immediately after the decision was announced and it will require a concerted effort upon the part of all physicians and all leaders in public health and education to counteract it.

New State Exhibits

To aid in this effort, the State Office has prepared two exhibits both of which will be on display in the Exhibit Arena. One is designed to impress upon the physicians their individual responsibility to act as leaders in public health education. The other is a brief review by means of colored slides shown by selectro-slide of one hundred years of medicine in Minnesota. The latter was prepared with a view to showing at many types of lay exhibits and meetings. All delegates, especially, are urged to view these exhibits.

No report would be complete without a grateful acknowledgment of the willing coöperation of our officers and committees. They have responded to every call made upon them and, frequently, at a considerable sacrifice of time and attention. The extensive program now carried on by the Association would be impossible without their aid. Thanks are also due to members of the staff of the office who have cheerfully put in long hours of overtime for the success of our program.

One Hundred Years

We have reason to be proud of the accomplishments of 100 years of medicine in Minnesota. Nowhere in the world are men healthier or better protected against communicable disease. The challenge of the next 100 years will be social as well as scientific. We must protect the fruits of past labors as well as go forward and our progress must include constantly improved methods of distribution and delivery of service as well as improved methods of protection from death and disease.

The Minnesota State Medical Association will continue to take a leading role in accepting that challenge.

B. B. Souster, M.D., *Secretary*
R. R. Rosell, *Executive Secretary*

CHAIRMAN OF THE COUNCIL

At the time of the annual meeting in 1940, sessions of the Council held on April 21 and 22 were reported to the House of Delegates. Meetings were held on April 23 and 24 which have not yet been reported.

On April 23, 1940, one of the important matters discussed was the status of Rest Homes, especially in the Twin Cities. This matter was postponed for later discussion after the Committee on Hospitals and Medical Education had had time to study it. At that meeting it was also decided that a Council committee of three be appointed to consider the advisability of drawing up a uniform minimum fee schedule. The Chair appointed Doctor Elias, Doctor Will and Doctor Simons.

You will remember that at a previous Council meeting, representatives of insurance companies appeared before the Council and discussed in detail the various malpractice insurance policies. Mr. Brist gave a review of the situation as presented at the previous Council meeting. It was recommended by the Medical Advisory Committee that no particular company should be given preference but that members should investigate their policies thoroughly and carry adequate protection, detailed information to be obtained from the state office. It was also decided by the Council to request the Medical Advisory Committee to continue its study of various policies and the companies carrying malpractice insurance.

At the meeting on April 24, 1940, there was a rather extended discussion of the necessity for allowing more time for the meeting of the House of Delegates and the inadvisability of introducing extraneous material and irrelevant speeches. It was finally decided that the Council meet earlier and that the House of Delegates convene in the afternoon prior to the opening day of the annual session, so that the meeting of the House of Delegates might be extended into the evening if necessary. Arrangements for this procedure have been adopted.

It was also recommended that an effort be made to bring before the general membership of the Association through the delegates more detailed information concerning medical economics and arrange for more time at the meeting of the House of Delegates for general discussion.

The Council awarded the distinguished service medal to Dr. C. B. Wright of Minneapolis, subject to the approval of the House of Delegates. This award has not yet been confirmed by the House of Delegates but doubtless will be. Dr. Wright was informed of the action of the Council by the Chairman and flowers were sent to him at the hospital.

The Council decided to adopt Dr. Adams' suggestion that literature on medical economics and state medicine be placed in the public libraries of the state. This was referred to the Editorial Committee of the Committee on Public Health Education and has since been carried out in a very thorough manner.

Dr. R. L. J. Kennedy, Chairman of the sub-Committee on Child Welfare, recommended that there be appointed by the President a special scientific committee on Child Health, and that the Chairman be an ex officio member of the Committee on Public Health Education. His suggestion was adopted and led to a general discussion on the advisability of reconstruction of committees so that more effective action in scientific lines might be carried out. This discussion was resumed at a later meeting of the Council.

Since the annual meeting, the Council has held three sessions: September 22, 1940; December 15, 1940 and February 21, 1941. At the meeting on September 22, it was noted that the paid membership was 2,546, a slight increase over 1939. There was considerable discussion concerning the dues of members called to military service and a committee was appointed to make a study of this question.

Dr. J. M. Armstrong, for many years a member of the Editing and Publishing Committee and Chairman of the Historical Committee, announced his retirement from practice and resigned as Chairman of the Committee. A vote of appreciation was extended to Dr. Armstrong and it was requested that he continue at least as a member of the Historical Committee even if he did not desire to continue as Chairman.

The college lecture course was approved for 1940-41.

Dr. Hammes, newly appointed Chairman of the Committee on Medical Testimony, gave an extended report and the Council decided to continue this committee as a permanent committee to review court cases in which medical testimony has been given and in which a portion of the testimony appears to the court to have been so contradictory as to indicate that medical witnesses might be consciously deviating from the truth. The situation with respect to medical testimony has been so unsatisfactory in the courts that this committee was regarded by the Council as of great importance.

Dr. J. M. Hayes was appointed as delegate to the American Medical Association to fill the position created by the reapportionment of delegates. Dr. Will was appointed as alternate. Dr. Adson was appointed as alternate for the present delegate, Dr. Savage. There is one other delegate to the American Medical Association to be elected by the House of Delegates of the State Association.

At the meeting on December 15, 1940, the financial status of the Association was considered in detail. It was found possible to recommend the transfer of $6,000 to the Investment Advisory Agency. In 1939 the Finance Committee had been given the privilege of transferring $4,000 to the Investment Advisory Agency, and in 1938 $4,000 had likewise been transferred.

The Council is the finance committee of the Association and it might be well to call attention at this time to the progress which has been made since 1937. The improvement in the financial status of the Association has been due to coöperation on the part of all committees and officers but especially to the centralization of administrative activities and the efficiency of the Executive Secretary and the administrative staff. The routine work of committees has been carried out by the office personnel and charged to administration. The technical exhibits, thanks to the former constructive work of Dr. Meyerding and the present efficiency of Mr. Rosell, have more than paid the cost of the annual meetings. For many years our investment fund was increased only by interest received. It gradually grew from about $27,000 in 1933 to $32,000, par value, in 1938. On December 31, 1938, $4,000 was transferred from the general fund to the Investment Advisory Agency. In 1939, $4,000 was ear-marked for the Investment Advisory Agency and in 1940, $6,000 was so appropriated. On March 1, 1941, the cost value of securities and cash amounted to over $48,000. The market value at this time was over $45,000, the depreciation being almost entirely accounted for by $3,000 worth of bonds of Nicollet Avenue Properties which were purchased many years ago, at a time when they were regarded as sound.

Dr. Myers, Chairman of the Sub-committee on Tuberculosis, explained the tuberculosis control project proposed for Meeker County. This was given approval by the Council and an appropriation was made available for the work.

Mr. Finke, director of the Division of Social Welfare of the State, requested that present members of the Medical Advisory Committee be continued for another year. This was approved.

A report on the vaccine and immunization campaign in Minnesota showed that thirty-five counties had, up to that time, conducted vaccine or immunization campaigns, or both, in 1940. Active encouragment was given by the Council to this movement.

Dr. Chesley asked and received the support of the Council in obtaining appropriations from the legislature for the Division of Vital Statistics and Sanitation and for establishment of a Division of Industrial Hygiene.

The Committee to consider the payment of dues of members called into service reported in detail and it was decided to request the local societies to pay the dues of those members who themselves are unable to pay. This matter was referred to the local societies for their decision. It was also decided to maintain an approved list of physicians who are willing to take the place temporarily of physicians absent for military service, their contract to be approved by the State Association and agreed to by the parties concerned.

The Minnesota Hospital Service Association discussed in detail the proposed bill to be presented to the legislature as an enabling act which they stated was essential to the life of the Minnesota Hospital Service Association.

The various scientific and Council Committees were appointed and approved for 1941. The Council appointed a committee to make a study of scientific and nonscientific committees with a view to re-arranging the committees on a more effective basis.

The Chairman was absent from the meeting on February 21, 1941. Dr. Stewart, clerk of the Council, presided. At

this meeting there was extended discussion of a variety of topics: plans for prepaid medical service, compulsory automobile insurance, and medical relationships to the National Youth Administration and the Farm Security Administration.

A plan presented by the State Board of Health for a study of maternal mortality in Minnesota was approved by the Council.

A proposal for the consolidation of state institutions with the Division of Social Welfare of the State was thoroughly discussed and a committee of three was appointed which recommended that the situation be investigated by a qualified organization, such as the American Hospital Association, American College of Surgeons, or the American Medical Association.

A plan for physical examination and rehabilitation of clients of the National Youth Administration was referred to Dr. Coventry, Chairman of the Committee on Low Income and Indigent Problems, and was later voted on favorably by the Council by mail.

The Council unanimously approved of a resolution drawn up by the Committee on Child Health in regard to Governor Stassen's public welfare proposals, especially with respect to his housing plan.

The Council was informed concerning the several proposals of motion picture companies during the last year to portray the lives of the Doctors Mayo. These proposals so far have been checked. The Council approved of the attitude of the Board of Governors of the Mayo Clinic, to the effect that such a portrayal would be a violation of medical ethics and that these proposals could be reconsidered only in the event of approval by the Board of Trustees and House of Delegates of the American Medical Association, and by the Council and House of Delegates of the Minnesota State Medical Association. Since that time the Board of Trustees of the American Medical Association has decided against giving their approval.

These are some of the topics considered and actions taken by the Council during the year. Detailed minutes are open for inspection by any of the Delegates or other members.

May I again take this opportunity to express my appreciation of the fraternity, loyalty, honesty, tolerance, fairness, and good judgment of the members of the Council and the officers of the Association, and to commend the efficiency and ability of our legal adviser, our Executive Secretary and the administrative staff.

H. Z. Giffin, M.D.

TREASURER

The attached statement of cash receipts and disbursements for the year which ended December 31, 1940, was made by Shannon and Byers, Certified Public Accountants, who finished auditing the books of the association February 24, 1940, and found them to be correct in all respects.

In accordance with the request of the House of Delegates made at the 1940 meeting a comparative summary of the finances of the association in 1940 and 1941 is provided on page 2 of the statement. It will be noted from this comparison that there was a net profit of $5,038.34 in 1939, while the net profit for the year 1940 was $8,619.84. Of this sum $3,451.68 represents net earnings from sale of exhibit space at the Annual Meeting.

The finances of the association continue in excellent condition as the statement indicates. Delegates and members are urged to study the statement carefully for a better understanding of the administration of association affairs.

W. H. Condit, M.D.

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDED DECEMBER 31, 1940

CURRENT FUNDS

Cash on Hand December 31, 1939:		
American National Bank, checking account	$ 2,358.58	
savings account	18.89	
exhibit checking acct.	2,646.50	
exhibit savings acct.	1,290.35	
Farmers & Merchants Bank, savings account	5,177.59	
First National Bank, savings account	37.66	
		$11,529.57
Cash Receipts, Year 1940:		
Dues collected:		
For year 1939 and prior	$ 270.00	
For year 1940	33,472.50	
For year 1941	4,725.00	38,467.50
Technical Exhibit rentals collected:		
For year 1940	5,107.50	
For year 1941	2,877.50	7,985.00
Annual meeting banquet and luncheons		1,074.50
Bruce Publishing Co. (Minn. Med.)		1,239.07
Interest and dividends		358.05
Social security tax refund		577.61
Total receipts		$49,701.73
		$61,231.30
Cash Disbursements, Year 1940:		
Special committees:		
Diabetes	278.39	
Historical	6.00	
Hospital and medical education	19.94	
Medical Advisory	24.95	
Medical economics	713.58	
Public health education and radio	3,732.12	
Public policy	6,699.97	
State health relations	21.50	
Unbudgeted committees	657.44	
Conferences and meetings:		
Technical Exhibit and Annual meeting	5,677.24	
A.M.A. delegates	309.10	
Conferences	86.55	
Council meetings	268.82	
County officers' meetings	397.75	
Minnesota Medicine	4,931.50	
Office equipment	1,174.79	
Membership expense	140.92	
President's contingent fund	298.94	
Administrative:		
Executive secretary's salary	5,000.00	
expenses	1,257.72	
Office salaries	5,430.00	
Office salaries, extra help	52.65	
Office rent	1,410.00	
Office supplies	216.42	
Postage	388.05	
Telephone and telegraph	349.97	
Miscellaneous expense	244.97	
Audit and insurance	213.94	
Minnesota unemployment tax	268.38	
Federal unemployment tax	30.30	
Social security tax	92.55	
Periodicals	84.90	
Secretary's salary	200.00	
Secretary's expenses	56.88	
Treasurer's salary	100.00	
Total disbursements		40,836.23
Cash on Hand, December 31, 1940:		
American National Bank, checking accounts	1,540.49	
savings account	1,074.73	
exhibit checking acct.	2,828.26	
exhibit savings acct.	1,305.32	
Farmers & Merchants, savings account	5,281.93	
First National Bank, savings account	150.83	
First Federal Savings and Loan Association	3,113.05	
Minnesota Federal Savings and Loan Association	5,100.46	
Total Cash on Hand		$20,395.07

Comparative Summary

	Year 1940	*Year 1939*
Income:		
Income from dues	$33,277.50	$32,429.00
Other income	4,943.20	2,843.43
	38,220.70	35,272.43
Expenses:		
Special committees	12,492.06	12,934.89
Conference and meetings	1,126.60	873.46
Administrative	15,982.20	16,425.74
	29,600.86	30,234.09
Net Profit	$ 8,619.84	$ 5,038.34

COUNCILOR OF THE FIRST DISTRICT

I know of no major problems concerning the societies of the First District. Last year attention was called to the practice of medicine by the Eagles Lodge of Austin and the support given by the Mower County Medical Society and the Council of the State Medical Association in the legal proceedings involved. Since that time this matter has been appealed to the Supreme Court of Minnesota and an opinion adverse to the Eagles Lodge rendered. The lodge has ceased furnishing medical care and the physician involved has become a member of the local society. I understand that there is some national

effort through Congress to permit the Eagles Lodge to supply medical care. This situation is of national importance especially in light of the recent adverse decision of the suit in Washington against the American Medical Association et al. Special attention on the part of the State Association will doubtless be necessary in combating national efforts of this type.

There is still some reason to believe that coöperation between county welfare boards and the advisory committees of the component medical societies could be improved.

H. Z. Giffin, M.D.

COUNCILOR OF THE SECOND DISTRICT

There has probably been more activity in the line of scientific and economic meetings in this district this year than in any previous year. Harmony and very marked loyalty to the State Association has been noteworthy. Our esteemed member, Dr. Frank M. Manson of Worthington, Minnesota, has retired from active practice but happily remains in our society as an affiliate member.

There is no doubt but that the physicians of Southwestern Minnesota are keeping to the highest standards of good medical practice.

L. L. Sogge, M.D.

COUNCILOR OF THE THIRD DISTRICT

The membership of the Third District shows an increase over the same period of a year ago.

The societies of this district have functioned well, with the result that problems have been met successfully, as they arose.

The tuberculosis project, carried on in Meeker County, promises to become a success, and it is hoped that it may serve as an example for the rest of the state, and, perhaps, for the nation as well. Much credit should be given to Dr. J. A. Myers, Chairman of the Sub-committee on Tuberculosis, and to the members of the Meeker County Society for their enthusiastic support of this worthy cause.

The effect of the drought, which hit part of the Third District very hard, is gradually wearing off, and conditions are again more nearly normal.

The problem of caring for the indigent in need of medical and hospital care, in my district, has been greatly lessened through the aid of the Social Welfare Department and by the sympathetic understanding of Mr. Finke and Dr. Hilleboe. Although a continuance of this help will of necessity be needed for an indefinite period, it is my hope and belief that, with continued favorable crop conditions, many of these people will regain their courage and self-reliance and become self-supporting.

The hospital insurance plan, offered by the Minnesota Hospital Service Association, is being well received among the farming population and promises to be a success.

C. M. Johnson, M.D.

COUNCILOR OF THE FOURTH DISTRICT

During the past year things have been running smoothly in the Fourth District. The component societies have all been active in routine professional work and also laying considerable emphasis on matters of medical economics.

Immunization and vaccination in schools has been done and accepted well by the public. At present Mantoux tests are being given.

The membership is up as it should be, and each county is working out its problems of care of the indigent, with the doctors ready to do their share.

Of special interest in the past year, has been the arrangement for Draft Boards, as well as Advisory Boards, with twelve Draft Districts and two Draft Boards in this Councilor area. The men have been very coöperative in accepting positions on both the Draft and Advisory Boards, there being very few refusals.

There was only one medico-legal malpractice case that came to trial, and I am happy to report that the doctor involved took the right attitude of sticking to the truth and yet protecting the other doctor. The advice which our Association has given in the handling of these cases since the Advisory Board has been established, is remarkable; and the lesson that it brings home is—treat the other fellow as you want to be treated yourself—and nine times out of ten no trouble will be started.

The Minnesota Hospital Service Association has extended its work in the communities of this district, adding a number of hospitals.

One of the doctors of this district has been made an affiliate member during the year.

About a half dozen doctors in this District refused or overlooked the filling out of the blanks for the Medical Preparedness Program for the AMA—some for personal reasons; others apparently didn't see the importance of it. This, of course, should not be so, since the medical profession has always been ready to do its bit for the country.

The matter of taking care of dues for those absent in medical service, has been nicely handled in the various County Societies.

The death of Dr. J. S. Holbrook, former Councilor of this district, occurred during the past year, and I wish again at this point to emphasize the great loss to the District.

I wish to express my appreciation for the coöperation of the societies and officers of this district, and to offer my services at any time in the near future for their welfare.

A. E. Sohmer, M.D.

COUNCILOR OF THE FIFTH DISTRICT

During the past year there have been no major problems that have come up for consideration.

A conference was held with the Executive Committee of the Ramsey County Medical Society regarding the status of dues to be paid by members that have entered military service. At that time I explained to the committee the position that had been taken by the State Council.

The component societies of this district have been very cooperative in supplying information at different times that has been requested through the central office.

E. M. Jones, M.D.

COUNCILOR OF THE SIXTH DISTRICT

Since Sepember, 1941, the membership of the Hennepin County Medical Society has increased from 678 to 698. In addition to these active memberships courtesy membership has been extended to twelve visiting physicians connected with the Veterans Administration and the Navy Recruiting Service. Also about eighty-four interns, residents and fellows now have Junior membership in the society.

The society has been active in extending its influence in community affairs and through a new department, Community Planning, is attempting to improve the coördination of private and public agencies to prevent duplication of service.

The Council probably will be interested to know that the International Assembly of the Interstate Post Graduate Medical Association will be held in Minneapolis, October 13 to 17.

C. A. Stewart, M.D.

COUNCILOR OF THE SEVENTH DISTRICT

Although attendance of medical meetings and harmony among physicians in the Seventh Councilor District have been at a high level during the past year, some features of medical economics and some problems arising from induction of physicians into service under the National Defense Act have caused grave concern.

Free choice of physicians for medical care of the indigent, medical fees for relief patients, and abuses of rights and privileges in medical care of the indigent have been the major economic problems. So far as is known, each such problem has been harmoniously solved through coöperative efforts of the physicians and personnel of the Department of Social Security.

Prior to induction of physicians into the military service under the National Defense Act, questions were raised concerning maldistribution of physicians in north-central Minnesota. Spot-maps showing location of physicians, together with maps showing population distribution as prepared by R. R. Rosell, Executive Secretary, and the personnel of his office, demonstrated clearly that adequate medical care is within the reach of the most distant settlers of this sparsely populated territory.

However, since mobilization of medical personnel under the National Defense Act started, physicians have been called from some localities which suffer from lack of, or insufficient, physicians to provide medical care. This will be especially true should any epidemic appear. Future maldistribution of physicians, should it develop to great proportions, should, however, be attributed to the necessities of National Defense, and not to faultiness of the American System of Medicine.

Edwin J. Simons, M.D.

COUNCILOR OF THE EIGHTH DISTRICT

During the past year the Councilor of the eighth district has attended a number of meetings in his district at which Farm Security and National Youth Administration plans have been discussed with local societies. He has also attended Council meetings and other gatherings, rendering what assistance he could in furthering the society work. It has seemed that he could better serve by listening carefully to the plans and opinions of R. R. Rosell, F. Manley Brist, our attorney, B. J. Branton, our president, and the various committee chairmen than by attempting to gear into the motor that drives—possibly I had better say drags—the Minnesota State Medical Association.

As long as this type of officer is continued, the work of Councilor will not be too burdensome. At times it is really pleasant.

W. L. Burnap, M.D.

COUNCILOR OF THE NINTH DISTRICT

The St. Louis County Medical Society, which comprises the ninth district of the association, reports to your body another successful year of activity and unison in the spirit of its membership. Meetings have been held regularly and a close contact has been maintained with members throughout the whole district. Officers meet regularly with the Range Medical Society at their meetings and recently by-laws were amended to require two of the meetings of the year to be held on the range. About half of each meeting has usually been given to the consideration of economic affairs and information from the state office.

The Secretaries' Conference was attended by a majority of the officers and was well reviewed at the subsequent meeting.

The membership has responded unanimously in the survey of medical defense by the American Medical Association. An adequate defense fund has been subscribed for the payment of dues of its members called into service. Members associated

with the draft boards are contributing all services that have been required.

At the present time, examinations are being made for the National Youth Administration in accordance with their request and schedule.

An opportunity was presented to the Itasca County Medical Group to participate in a medical insurance plan to recipients of farm loans made by the Federal Security Administration. Following a meeting between the Itasca County physicians and representatives of the F.S.A., the plan was rejected.

Courses in pediatrics and obstetrics, sponsored by the State Board of Health, have been attended by all allotted and well reported to the whole membership in Duluth and other districts.

F. J. Elias, M.D.

Doctor Burns: The Reference Committee read, considered, approved and recommended adoption of all officer and councilor reports.

Doctor Will then called for additional remarks from those whose reports were covered and, there being none, it was moved, seconded and carried that they be accepted.

Doctor Will called for the reports of the Reference Committee on State Health Relations, Dr. J. M. Hayes of Minneapolis, chairman.

Following are the reports:

COMMITTEE ON STATE HEALTH RELATIONS

The committee on State Health Relations has continued to coöperate with the various other committees and officers of the Society and with the State Board of Health. The committee has had several meetings itself during the past year.

An attempt has been made to follow up as to how well the State Institutions were able to carry out the recommendations made by our committee several years ago. This follow-up is still being completed.

The possibility of using qualified pathologists as medical examiners in place of coroners or supplemental to them has been proposed. The matter is being studied now as to its availability for the large cities and possibly for the state at large but further study is necessary.

The chairman has on the request of the Council attended two meetings with the Legion regarding its proposed program for improvement of national health and welfare through physical education and has agreed to act on an advisory committee as a representative of the State Medical Association. At present the definite proposed activities have been referred to various sub-committees for study and nothing further can be reported thus far.

The Legion's proposal for periodical health examinations which our committee considered with the Legion two or three years ago has apparently not been established on a state-wide basis by the Legion, although there has been some activity in a few localities in the state. Our coöperation has not been asked during the past year in that regard.

In our report a year ago we mentioned our offer to assist the State Civil Service Board. Our assistance was not requested by the Board or the Interim Committee. However, Dr. Earl represented us in the hearing in January when representatives from the dental association also were heard. Dr. Earl's discussion evidently helped greatly in improving the Civil Service status of various professional employes of the state.

T. H. Sweetser, M.D., *Chairman*

COMMITTEE ON UNIVERSITY RELATIONS

Work of the Committee on University Relations has been concerned with several inquiries and recommendations brought to it from outside sources. One concerned medical training given to students in physical education at the University. Reports that these non-medical students were trained in the use of the stethoscope were found to be without foundation in fact.

The committee has also had under consideration a new recommendation for bestowal of the Association's Distinguished Service Medal. Action on this latter matter will undoubtedly be taken when the committee next meets at the time of the Annual Meeting.

Dr. H. S. Diehl, Dean of Medical Sciences, and the faculty of the University Medical School continue to work in sympathetic coöperation with the practicing profession represented by the Minnesota State Medical Association to protect the physician and extend the public welware in Minnesota.

B. S. Adams, M.D., *Chairman*

Note: *The Committee on Public Policy submitted a detailed mimeographed report which will not be published but interested members may apply to State Association headquarters for copies.*

Dr. J. M. Hayes, chairman of the Reference Committee on State Health Relations, reports: The committee believes there is no more important unit in the entire state medical association organization than the Public Policy Committee headed by Doctor Sogge. We are going to ask Doctor Sogge to read his report to you tonight but in the meantime, may I point out to you that few of the delegates realize how much time Doctor Sogge puts in at this work. I am a member of his committee but neither I, nor any of the rest of us, can claim much credit for the splendid record he has made.

Most of you will recall the investigation of medical services at State Institutions which was undertaken earlier by Doctor Sweetser and his State Health Relations committee. You may not know that many of the suggestions made at that time have been followed by the state department and that the study still goes on to see that all necessary improvements are made.

A word should be said about the function the committee and its chairman is performing in an advisory capacity for the American Legion program for national health through improved physical education. Until the committee stepped in the Legion program was not under much supervision but they are willingly cooperating with medicine now through the medium of Doctor Sweetser's group.

Attention should be called to the fact, also, that the Committee on University Relations, and Doctor Adams, as chairman, has been in close touch with the University authorities serving as a medium for discussion of joint interests of both groups. The committee recommends that all these reports be accepted.

Doctor Will called attention of the delegates again to the announcement that Doctor Sogge would present his report in person at the evening session and there being no additional remarks from chairmen of the other two committees, he announced that action by the delegates on the reports would be deferred until after Doctor Sogge's verbal report.

Doctor Will then called for the report of the Reference Committee on Lay Education reports, Dr. O. J. Seifert, chairman (represented on the floor by Dr. P. C. Benton).

Following are the reports:

PUBLIC HEALTH EDUCATION

As chairman of the Committee on Public Health Education it pleases me to comment upon our activities and to pay particular tribute to Mr. Rosell, to Mrs. Fitzgerald, and the staff of the society's headquarters, for the very efficient manner in which they are directing our affairs.

I wish particularly to call attention, from the standpoint of health education, to the very great value of the monthly packets that have been sent out. In a measure, these monthly reports and assemblages of vital information to doctors, have given the University an opportunity to hold practical contacts with practicing physicians. To the various medical staffs and groups at the University go our sincere thanks, and on behalf of all the members of the state society I extend to them our very grateful thanks. Obviously, the same thanks go to all those outside the University, in that we may call extracurricular activities, for all they have done to develop and make useful carefully drafted summaries outlined in each monthly packet.

An expression of thanks should also go to the various newspapers of the state and elsewhere who have drawn upon this material and used it to increase the interest in their own publications, and made available to their readers useful, important and helpful guides.

In the same order, the radio programs, masterfully given by Dr. William O'Brien, have continued effectively and splendidly, and the public response has been most gratifying.

The Speakers' Bureau has functioned well, and has provided speakers for many societies, clubs, and several university and teaching institutions.

Great credit goes to Dr. A. B. Stewart of Owatonna for continuing his interest along the line of first aid in connection with the Red Cross. At the recent sectional meeting of the American College of Surgeons held at Minneapolis it was a pleasure to note that he was not only present, but actively engaged in the round table discussions now so necessarily implemented and coördinated with defense movements and the development of our military forces.

Our most active sub-committee has been that under the able guidance of Dr. J. A. Myers, and concerns the study, well known to most of you, centering around the work of the physicians of Meeker County and Litchfield. This committee

has held many meetings at Litchfield which, unfortunately, your committee head was unable to attend. However, it is striking and noteworthy that the minutes of the various meetings held indicate the constant attendance not only of most of the physicians of Meeker County but many of the men connected with the administration of the state society and others interested in our tuberculosis sanatoria and tuberculosis prevention in general.

We must all watch for the ultimate reports on this investigation, because it is a critical attempt to approach the problem of the prevention of tuberculosis along a concerted plan, and it promises a great deal. In due time this sub-committee will present to the state society suggestions which can ultimately guide the state as a whole in its campaign to eliminate tuberculosis.

E. L. Tuohy, M.D., *Chairman*

RADIO COMMITTEE

For the past year the Minnesota State Medical Association has sponsored a program each Saturday from 11:00 to 11:15 a.m., since changed to 10:45 to 11:00 a.m., over radio station WCCO, Minneapolis, and St. Paul; WLB, University of Minnesota; and KDAL, Duluth (except as noted below).

The speaker has been William A. O'Brien, Professor of Preventive Medicine and Public Health, Medical School, University of Minnesota. The subjects follow:

1940 June 1 What Is Diabetes
8 Management of Diabetes in Children
15 Management of Diabetes in Adults
22 (No broadcast)
29 Fourth of July Injuries

July 6 Summer Skin Problems
13 The Value of a Vacation
20 Gastro-intestinal Diseases in Summer
27 Toothache

August 3 Leg Cramps
10 Hyperchlorhydria
17 Embolism
24 Sacro-iliac Disease
31 New Dentures

September 7 Cause of Home Accidents
14 Prevention of Home Accidents
21 First Aid in the Home
28 Injury of the Teeth

October 4 Scarlet Fever
11 Whooping Cough
18 Measles
25 Growth of the Teeth

November 2 Eye Injuries
9 Glaucoma
16 The Crosseyed Child
23 Cataracts
30 Children's Dentistry

December 7 Otitis Media
14 Cause of Hearing Loss
21 When Deafness Comes
28 Modern Scientific Achievements

1941 January 4 Common Cold
11 Influenza
18 Pneumonia
25 Exodontia

February 1 Posture and Backache
8 Causes of Backache
15 Back Injury
22 Periodontia

March 1 Vital Statistics
8 Records of Birth
15 Life's Increasing Span
22 Diseases of Middle Life
29 Orthodontia

April 5 Cancer in Women
12 Radium and X-ray
19 When Cancer Begins
26 Tumors of the Mouth

May 3 Summer Round-up
10 The Community Hospital
17 Maternal Hygiene
24 Better Health for Babies
31 Care of Children's Teeth

The last broadcast in each month was usually sponsored by the Minnesota State Dental Association. The Dental Association has repeatedly expressed its appreciation to the medical profession for this coöperative effort. The subject material for each month except during the summer was keyed with the educational packet issued by the Minnesota State Medical Association for physicians.

Radio station WCCO has given time to the Minnesota State Medical Association each week since April 4, 1928 (over 13 years), for which we should be duly grateful, as it is the most powerful station in the Northwest.

A new program was started September 25, 1940, over radio station WLB, entitled "Your Health and You." It was given Wednesday from 11:00 until 11:15 a.m. for pupils in school grades six through nine. Students listened in groups with the teacher. For wider coverage, radio station WLB sent the program over the Northcentral Broadcasting System (Mutual). The programs were arranged by Dr. William A. O'Brien, who gave each talk. The program is endorsed by the Minnesota State Medical Association and the Minnesota Public Health Association. It was learned through a survey that more than 8,000 school children "attended" these public health classes. If wider publicity and greater coöperation are given to this effort next year, more junior high schools will take the program. The subjects were as follows:

September 25 Health Ideas and Practices

October 2 Foods We Eat
9 Nutrition of Body
16 Weight and Health
23 Mind and Body
30 Rest and Sleep

November 6 Feet and Posture
13 Play—the Business of Childhood
20 Cleanliness and Godliness
27 Air and Sun

December 4 Eyes and Ears
11 Mouth—Gateway to Health
18 Fads and Fallacies

January 8 Prevention versus Cure
15 Community Health

February 5 Contagious Diseases
12 Accidents and You
19 Allergic Children
26 Tuberculosis, the Foe of Youth

March 5 Do You Hear Well?
12 The Common Cold
19 Why Glasses Are Worn
26 Your Teeth

April 2 Appendicitis
9 Milk—the Perfect Food
16 Specific Disease Protection
23 Protective Foods
30 Diphtheria Prevention

May 7 Diabetes and Insulin
14 Smallpox Prevention
21 Health Habits

It will be noted that the subjects for the year have coincided as far as possible with the so-called "subject-of-the-month" program of the association thus providing an exceedingly valuable coördination of educational effort between the radio, newspaper and packet services of the association.

Additional radio programs on other networks are under discussion and will be worked out when the most effective and practicable type of broadcast for the purpose has been determined. In the meantime, activity by representatives of local medical societies wherever there are broadcasting stations is highly desirable. The representative and type of program should be determined by the local medical group and the broadcast should be sponsored by the medical society. Assistance of the committee is available to any society in the state which contemplates inauguration of local radio programs.

R. M. Burns, M.D., *Chairman*

COMMITTEE ON THE CONSERVATION OF HEARING

In spite of many obstacles definite progress in the work of this committee has been made during the past year. The unsettled condition in the State Department of Education, the concentration of medical and public interest in national preparedness and the failure to secure legislation to provide funds to make possible uniform, standardized hearing tests of school children through coöperation of the State Board of Health and the State Department of Education have proved disappointing. Nevertheless your committee can report gratifying growth of interest among the medical profession and general public in this field of preventive medicine.

There is a definite increase in the number of schools throughout the state in which modern hearing tests are employed.

Your members have presented the subject before various public health and educational groups.

Under the joint sponsorship of the Department of Public Health and Preventive Medicine and the Department of Ophthalmology and Otolaryngology of the University of Minnesota a special course on the conservation of hearing for public health nurses, medical social service workers and other qualified persons has been instituted. This course is offered during the spring quarter and the first half of the summer session.

Studies are now being conducted to determine the relative advantages of tests made by the phonograph and pure tone audiometers as used for screening purposes among school and industrial groups. Recently it has become known that many younger individuals have significant hearing losses for the high tones which are not disclosed by the phonograph audiometer.

This committee has available a limited amount of equipment to loan under certain conditions to schools which can provide responsible, experienced nurses or technicians who are in a position to make satisfactory demonstration or introductory hearing tests. It can also provide speakers on the subject of conserving the hearing before local or county medical, public health and parent-teacher groups.

HORACE NEWHART, M.D., *Chairman*

COMMITTEE ON MATERNAL WELFARE

During the past year a preliminary report on a study of maternal and infant mortality covering a period of ten years was made by Dr. Viktor Wilson. Because of the marked difficulty in obtaining accurate information, particularly in maternal deaths, the Maternal Welfare Committee has suggested a proposal for a maternal mortality study in the state of Minnesota to be carried out over a two- or three-year period and preferably by an investigator who is an obstetrician, so that accurate information may be obtained. This study is sponsored by the Maternal Welfare Committee and has been approved by the councilors of the Minnesota State Medical Association and is undertaken with the coöperation of the Minnesota State Board of Health. The essential purpose of this study will be to determine accurately the cause or causes of maternal deaths and to provide the medical profession of the state with information useful in protecting the life and health of mothers. It is hoped that the information obtained from this study may serve an educational purpose and that the information so obtained will be considered the joint property of the Minnesota State Medical Association and the State Board of Health.

The new birth certificates have been discussed and studied at some length. The Committee is of the opinion that the birth certificates should follow the United States Census Bureau Standards.

Information is being gathered concerning the advantages of silver acetate over silver nitrate for use in the Crédé method of preventing ophthalmia neonatorium. Dr. Arthur D. Hirschfelder and the Council on Pharmacy and Chemistry of the American Medical Association are coöperatiing in gathering this information. A further report on this problem will be made later.

RUSSELL J. MOE, M.D., *Chairman*

SUB-COMMITTEE ON FIRST AID AND RED CROSS

On June 4, 1940, the chairman of the Committee on Red Cross and First Aid of the State Medical Association met by appointment with Dr. Harold S. Diehl, Dean of Medical Sciences of the University of Minnesota, and discussed the advisability of teaching First Aid in the medical school.

On June 11 the Dean wrote that the Administrative Committee of the Medical School had authorized a course in First Aid for freshmen medical students during the first quarter that they were enrolled in the medical school.

Two bills were introduced in the legislature, under auspices of the committee, one relating to proper equipment for Ambulance Service for Hire and one to regulate School Bus Service. The first failed to pass but the second had just passed both the House and the Senate as this report was put in the mail. It provides not only for proper First Aid equipment including splints, etc., for school buses but also for the training of drivers in First Aid.

We are making some progress toward having First Aid taught in junior high schools of the state; but we must continue to urge the doctors of the state to teach First Aid.

A. B. STEWART, M.D., *Chairman*

SPEAKERS' BUREAU

No new method of extending information by radio or exhibit or picture can replace the speaker who goes in person to talk before special groups such as women's clubs, PTA's, luncheon clubs, church societies or colleges.

The physician who makes these talks must be well prepared, however. He must know how to present his material simply, understandably and effectively, a quality which is not found in every physician no matter how well qualified he may be otherwise.

The Speakers' Bureau has worked hard during the last few years to assemble a group of such especially qualified speakers and to put them to use.

A considerable number of them have delivered lectures in our successful college lecture courses and have developed, in that most trying of assignments, into exceptionally effective speakers for lay audiences.

Many others are used constantly in connection with the Coordinated Medical and Public Health Program of the association. In response to invitations released each month to the newspapers, speakers are sent to talk to many types of organizations and clubs on the current subject-of-the-month. More than 40 of such talks were given during the past eight months. (No program is offered during the summer months.)

College lectures were offered as usual last fall to each college in the state, two to each college, and 14 of them availed themselves of the opportunity. Subjects were selected from a list of titles concerning which recent University graduates had expressed themselves by questionnaires as lacking in essential information.

F. H. MAGNEY, M.D., *Chairman*

COMMITTEE ON TUBERCULOSIS

NOTE: *Space does not permit publication of the extensive and completely documented report presented by this committee. Copies will be provided on request from the State Office to members who wish to read the report in full.*

A detailed account is given in the report of studies of current medical association effort to control tuberculosis; of previous demonstrations among cattle and in certain sanitorium districts of Minnesota; of standards of procedure adopted by the Committee for tuberculosis work including the tuberculin test types of tuberculin, x-ray films, clinical and laboratory examinations. Historical, geographical and social reasons back of the choice of Meeker County for the demonstration on an area basis of tuberculosis control under sponsorship of the Committee is given, including results of an early study by Lampson in Meeker County and an account of the historic fight for tuberculin testing of cattle made by the farmers of Meeker County which has culminated in the accreditation of every county in the United States.

The preparation for the demonstration is related in the report as follows:

The first meeting of the sub-committee and the physicians in Meeker County was held on November 7, 1940. As far as we know this is the first time that a county medical group has sponsored a complete tuberculosis control program. The various methods of attacking tuberculosis on a county-wide basis were discussed. It was considered that the first object of the county-wide program is to determine by the tuberculin test the incidence of primary tuberculosis at all ages of life. This is the best criterion of the present and future problem. Every person who reacts to the tuberculin test has been exposed either directly or indirectly to a contagious case of tuberculosis and every person who reacts to the test is a potential case of clinical tuberculosis some time in life. The retesting of all non-reactors, as well as the testing of all persons who are born subsequently or who move into the county, should be performed annually.

The second object is to determine who among the tuberculin reactors already has clinical lesions to the extent that they can be located by present methods of examination and to examine all other reactors with sufficient frequency to detect any new lesions which may appear before they have caused much destruction and before the disease has become contagious.

A third objective is to treat or isolate all such cases so as to prevent them from becoming contagious or to prevent the contagious cases from disseminating tubercle bacilli. When this is accomplished there will rarely be a contagious case of tuberculosis among the permanent citizens of the county and, thus, practically all infants will be born and reared in an environment free from tubercle bacilli.

Thus, the citizens of all ages of Meeker County would be divided into two main groups:

1. Non-reactors to tuberculin. 2. Reactors. The reactors would also be divided into two sub-groups: (a) Those who already have demonstrable clinical lesions; (b) All others who are potential cases of clinical tuberculosis.

Record forms have been printed by the State Medical Association, to be filled out in triplicate by the examining physician: One to be filed in the physician's office, another in the Litchfield Hospital, and the third in the office of the Minnesota State Medical Association. A card was also printed to be sent to the heads of households in the county, inviting the family to participate in the tuberculosis control program and to indicate on the return attached card the date when they would report for examination. These cards are to be sent to the heads of households of one township at a time.

The physicians practicing in Meeker County volunteered to administer tuberculin tests to every person in the county and the Minnesota Department of Health agreed to provide them with tuberculin. The physicians also decided that there must be no charge made to anyone for the x-ray film inspection of the chest and that funds must be procured from some other source to provide only for the actual expense of the x-ray film work. Therefore, the physicians, themselves, would derive no financial benefit but they would actually contribute professional work conservatively estimated at $100,000 to $150,000. It is doubtful whether in the history of Minnesota any group has ever manifested a more generous spirit.

It was estimated that approximately 25 per cent of the 20,000 citizens of Meeker County would react to tuberculin and would require x-ray film inspection. Therefore, it became a matter of procuring funds solely for the expense of the material and the exposure and development of the films. The Council of the Minnesota State Medical Association on December 15, 1940, voted $500.00 to the sub-committee to be used in any way it sees fit.

Dr. Karl Anderson, Medical Director of the Northwestern National Life Insurance Company, was invited to attend the committee meeting on March 13 to consider the possibility of suggesting to his company that it provide the funds necessary to cover the expenses of the project. Dr. Anderson presented

this proposition to Mr. Arnold, president of the company, who asked the chairman of the sub-committee, Dr. Stewart, and Mr. Rosell to confer with him. This was done on March 19, 1941. Mr. Arnold was sufficiently interested in the project to submit it to his Board for consideration.

From the outset, it was obvious that the public of Meeker County must be well informed as to the contemplated program.

Arrangements for a county-wide educational campaign were made, consisting of movie films, special programs in the schools, posters to be placed in conspicuous places throughout the county, radio talks, special educational pamphlets from the National Tuberculosis Association, presentations before the 4-H Clubs, the Boy and Girl Scouts, the Parent-Teacher Association, essay contests, frequent newspaper notices, and the development of a special speakers' bureau among the doctors.

At the January 16, 1941, meeting Dr. Lennox Danielson, President of the Meeker County Public Health Association, reported that already Mayor Baumgartner of Litchfield had delivered an address over the Willmar radio station outlining the county plan. Dr. H. E. Wilmot had presented the plan before the nurses of Meeker County; Dr. Lennox Danielson before the county nurse and thirty of her workers; Dr. Julia Danielson before the ministers of Litchfield. At this meeting it was decided that all of the local publicity and educational work should be directed by the Minnesota and Meeker County Public Health Associations and that other publicity should be directed by the Minnesota State Medical Association.

The April 17 meeting was attended not only by physicians but also by leaders of various organizations in Meeker County. Drs. W. A. O'Brien and F. E. Harrington presented splendid addresses on the fundamentals of tuberculosis control and the importance of a systematic program on a county-wide basis. They expressed great confidence in the ability of the physicians practicing in Meeker County to bring tuberculosis to an irreducible minimum in a reasonably short time. This would not only prevent much suffering and mental anguish caused by tuberculosis but it would also definitely reduce the cost of the care of tuberculous patients to the county and the state. All present at this meeting manifested enthusiasm concerning the tuberculosis control program and many expressed a desire to have it begin at the earliest possible moment. It was suggested that a large public meeting be held in the next two or three weeks when as much information as possible concerning the plan would be presented.

The chief problem at the present moment is due to the lack of funds to procure x-ray films. Provision must be made for enough money to defray the expense of materials. It is unreasonable to expect the physicians practicing in Meeker County to provide these materials since they have already volunteered to do all of the work of the entire program on a gratis basis.

J. A. Myers, M.D., *Chairman*

Dr. P. C. Benton, representing Dr. O. J. Seifert, chairman of the Reference Committee on Lay Education, reports: The committee recommends the adoption of all reports of the Committee on Public Health Education with the following comments:

Committee on First Aid and Red Cross—that more emphasis be placed on teaching first aid to doctors; that more emphasis be placed on teaching first aid to medical students; that a more specific program be devised to place the public teaching of first aid into effect.

Committee on Tuberculosis—that the committee continue its work as actively as possible with publicity and tuberculin tests even if funds for all x-rays are not available; that the association owes this committee a vote of thanks for the work already done and that the association continue to support the activity.

Radio committee—that letters of appreciation be sent to Doctor O'Brien, to radio station WCCO and to individual radio station members of the North Central Broadcasting System who have carried Doctor O'Brien's talks; that the radio committee consider further the possibility of making reprints of these talks available to groups interested in Public Health.

Doctor Will then called for further remarks by committee chairmen.

Dr. C. A. Stewart, substituting for Doctor J. A. Myers, chairman of the Committee on Tuberculosis: The new tuberculosis program is progressing and they have made a nice start. They are taking x-ray films already and are engaged in testing the entire population of the county selected. The program will continue over a considerable period and Doctor Myers will make a more complete report to you at some future time.

It was moved, seconded and carried that the recommendations of the Reference Committee on Lay Education reports be accepted.

Doctor Giffin then asked for a confirmatory vote on the distinguished service medal voted by the Council to the late Dr. C. B. Wright. It was moved, seconded and carried that the award be confirmed. Doctor Giffin also informed the delegates that the committee of the Council composed of the last three presidents of the association had recommended that the medal also be given to Dr. C. M. Jackson, for many years professor and head of the Department of Anatomy at the University of Minnesota, and Doctor L. L. Sogge of Windom, chairman of the association's Committee on Public Policy and former president. It was moved, seconded and carried that these medals be awarded, also, at the recommendation of the committee. It was further decided, at the suggestion of Doctor Giffin, that the medals be presented at the banquet to be held on Tuesday night.

Doctor Sogge expressed his appreciation for the honor and asked that Doctor Gullixson of Albert Lea and Doctor Palmer be allowed to present the problem of nursing education in rural hospitals. Doctor Gullixson explained the expanding role of the National League of Nursing Education as dictator of educational policies for all nursing organizations and of the State Board of Nursing Examiners. He charged that it was through the influence of the League and of state directors of nursing education controlled by the League that nurses' training schools had been abandoned in all but four of the smaller communities in the entire state. They remain only in Breckinridge, Faribault, Albert Lea and Red Wing. He said that the standards set by the League and the State Board were not feasible for smaller hospitals but that shortage of well-trained nurses is a serious problem in all rural communities. What these hospitals need and want is adequately trained bedside nurses at a price their patients can afford to pay. They want nurses' training schools for which high school graduates from rural communities can qualify and from which they can graduate with an R.N. degree, nurses who will be satisfied to remain in rural communities.

Doctor Gullixson asked the House of Delegates to authorize the Committee on Public Policy to join with the Minnesota Hospital Association in presenting a bill to the 1943 Legislature, outlining specific duties for the State Board of Nursing Examiners in their relations to the nurses' training schools throughout the state, providing for the highest standards possible for nurses' training compatible with the needs of all communities for nursing services. Already ten states have passed such legislation. The platform of the National League, adopted in 1940, provides that all nursing education shall follow one pattern, namely, two years of college or its equivalent as an entrance requirement and all teaching except in political fields and including basic sciences shall be done by nurses and follow a curriculum imposed by the League. The training school director shall be independent of the hospital conducting the schools and the budget for training must be provided separately and directed exclusively by the director. They advocate, in fact, government aid or a special fund for the purpose and direct that patients shall be cared for by graduate nurses primarily, with pupil nurses required to do only such nursing as may be necessary for educational purposes.

We need in nursing education those who took their training in special schools just as we do in medicine, Doctor Gullixson said, but we do not require that all nurses or all physicians be highly trained specialists. He expressed the hope that the association would aid in keeping Minnesota one green spot in the field of nursing education.

Doctor Sogge said he had with him a paper along the same lines by Doctor Charles Bolsta of Ortonville but would not read it. He suggested that the matter, together with the papers, a resolution and bill on the subject, be presented to the Committee on Resolutions for a report that night or at the session on Monday.

After some discussion it was moved, seconded and carried to refer the matter to the Interprofessional Relationships Committee for report at the Monday session.

Dr. D. P. Head then introduced a resolution from the Hennepin County Medical Society to change the by-laws of the association with reference to affiliate members so that members of the grade of Captain or under in the Army and Lieutenant Commander or under in the Navy, who are called to active duty, may be declared affiliates for the period while they are absent from their home communities and unable to continue their private practice, provided that the component society shall first have declared them affiliate and provided that affiliate membership shall automatically cease upon termination of disability or resumption of practice or return from military service.

The resolution was moved and seconded and extended discussion followed. It was then agreed to refer the matter to the Committee on Resolutions for further study with a view to reporting to the Council and the Delegates at a later time, for possible action, in accordance with the constitutional provision for changing the by-laws, at the next day's session.

Dr. C. L. Roholt of Waverly then outlined a bill which he presented to the Legislature this year providing that indigent emerency patients who are unable to gain immediate admittance to the University Hospital, be cared for in local hospitals with payment to the hospital on the same basis as a payment is now made to the University Hospital and that chronic patients be treated at home hospitals likewise, on the same terms, if they cannot be admitted within ten days to the University Hospital. He said that the bill was dropped when it was discovered that the only funds, earmarked to be paid half by the state and half by the county, are University funds. It is therefore planned, he said, to recast the bill for submission to the next Legislature, asking for a special appropriation earmarked for the purpose.

Dr. F. J. Savage, chairman of the Minnesota Division of the National Physicians' Committee, suggested that the House of Delegates meet with the National Committee at the luncheon of that body scheduled for Monday noon in order to hear John Pratt, executive secretary of the National Physicians' Committee, and other speakers. After some discussion, it was moved, seconded and carried that arrangements be made for the joint luncheon.

Doctor Will then announced appointment of Dr. A. H. Sanford, Dr. A. E. Cardle, and Dr. J. M. Hayes on the Committee on Resolutions and the meeting adjourned until 8:00 p.m.

8:00 P.M. Session

The meeting was called to order at 8:00 p.m. and, having ascertained from Dr. F. J. Lexa, chairman of the Credentials Committee, that a quorum was present, Speaker Will introduced Dr. Jennie Baker (wife of Dr. Norman H. Baker of Fergus Falls), who addressed the delegates as chairman of Health and the Summer Roundup of the Minnesota Congress of Parents and Teachers. Doctor Baker explained the objective of the Summer Roundup as a means of arousing the interest of parents in improving the health of their children, especially those entering school for the first time, and bringing about their continuous medical and dental supervision throughout their school lives. Doctor Baker read the resolution passed by the House of Delegates in 1936, approving the purpose of the Summer Roundup and offering its cordial coöperation to the Minnesota Congress of Parents and Teachers in promoting programs and in working out proper methods of procedure. Since she became chairman of the Summer Roundup, Doctor Baker said, she had been doing everything possible to urge upon mothers the necessity of taking their children to the doctor for a thorough examination. She favored examination of the children in the doctors' offices because it is obviously unfair to ask any doctor to make an adequate examination in a school house with a line up of children waiting for his attention. She said, however, that she has received a considerable number of complaints from mothers that doctors were not taking the examination seriously or giving a sufficiently thorough examination to warrant the effort to have the child examined. "We make no mention of fees because that is not our province," Doctor Baker said. "It is a matter for the doctor to settle with the mother of the child. We find that mothers as a rule are willing to pay but it is a vital part of our general health education effort that the doctor also emphasize the importance of thorough and frequent examinations throughout the child's school life.

"Our sole aim," Doctor Baker said, "is to educate the parents. We have nothing to do with the examination of the child. We want to help the doctor in every way possible and we want you doctors to tell us if you are not satisfied with the way the Summer Roundup is run."

Doctor Baker concluded by asking the delegates to get in touch with her if things were not going smoothly in any of their districts. She promised to do what she could to smooth things out.

Doctor Burns pointed out that in a long-time campaign such as the Summer Roundup effort, interest sometimes wears thin. He suspected that it has in St. Paul and suggested that the motion picture film, "When Bobbie Goes to School," be used generally to stimulate interests in objectives of the work.

Doctor Baker announced that the film was being shown daily at the Auditorium during the meeting and also that of thirty-seven affiliated schools in Saint Paul, thirty-five were signed up to carry on the Summer Roundup camp again this year, representing the best average of any large city in the state.

Doctor Will then asked Doctor Head to present the resolution by the Committee on Resolutions, presented by him at the afternoon session, as it had been rewritten in the interim.

WHEREAS, there exists a national emergency which will require the professional services of many members of the Minnesota State Medical Association in the army, navy, and marine corps of the United States, and

WHEREAS, such service will mean reduced income for many of the physicians serving in these branches and will make the payment of dues to medical organizations an additional burden or even hardship especially for those physicians commissioned in the lower ranks, and

WHEREAS, it is most important that in so far as possible, the membership of this Association be held intact throughout this emergency.

NOW, THEREFORE BE IT RESOLVED, That the House of Delegates of this Association does hereby instruct the Council when formally requested to do so by the proper officers or committee of a component society to waive the State Association dues for such members who are absent from their home community or who are unable to continue their private practice or who hold the rank of captain or below in the Army and Marine Corps or lieutenant commander or below in the Navy to continue thereon the pages as active members of the Association for the duration of the emergency.

Doctor Head moved that the motion made earlier by which men within the qualifications who left their home communities on active military duty were to become affiliate members of the association be withdrawn. It was seconded and carried.

Discussion brought out the fact that a number of societies throughout the state, including Red River Valley, Upper Mississippi, St. Louis, voted to make a special assessment of members to cover dues of men called to active duty; that the Committee on Resolutions and many delegates were opposed to amending the by-laws as proposed in the earlier resolution; that others were opposed to the word "waive" as applied in the second resolution. It was also pointed out that the Council had authority between sessions to determine the method of providing payment of dues for the members in question and to pass upon the eligibility in each case. It was decided to remove the word "waive" and substitute the phrase "provide payment." In that form it was moved, seconded and carried to accept the resolution subject to Council approval at the meeting intervening before the next session of the House of Delegates. Two further resolutions were presented by Dr. A. H. Sanford, chairman of the Committee on Resolutions. The first drawn up by Dr. Paul C. Leck of Austin was as follows:

WHEREAS, the Minnesota State Medical Board of Examiners has during the past two years investigated the practice of medicine by the Fraternal Order of Eagles, and

WHEREAS, through the office of Attorney General J. A. Burnquist, and through the Attorney for the State Board of Medical Examiners, Manley Brist, they have successfully concluded litigations which have effectively terminated the practice of medicine by that lodge, and

WHEREAS, the members of the State Board of Medical Examiners, the Attorney General, J. A. Burnquist, and Attorney Manley Brist, have faithfully carried on their efforts against great opposition until rewarded by the favorable decision of the Supreme Court of the State of Minnesota.

BE IT RESOLVED, That the Medical Association of the State of Minnesota extend to the Minnesota State Board of Medical Examiners collectively and individually, to Attorney General J. A. Burnquist, and to Manley Brist, Attorney, the warmest appreciation and sincere commendation for this splendid accomplishment. As delegate representing the Mower County Medical Society, in behalf of that Society, I do move that this resolution be adopted. (Signed) PAUL C. LECK.

It was moved, seconded and carried that the resolution be adopted.

The second, drawn by the Minnesota Branch of the American Medical Women's Association, was as follows:

WHEREAS, the United States of America is at present engaged in a vast preparedness program which includes the listing of members in the Medical Reserve Corps available for active service, and

WHEREAS, there are approximately 8,000 women physicians and surgeons in the United States who form only a small minority group in the 175,000 physicians, and

WHEREAS, the United States government has taken no cognizance of these women physicians in time of war, except to appoint them as contract surgeons in a few isolated cases, and the status of the contract surgeon is definitely inferior to the status of a man physician in the medical reserve corps on three accounts. First, there is no military ranking, hence curtailment of authority and the necessity of trying to do work under and on those conditions. Second, inferior salaries. Third, no war-time insurance. And

WHEREAS, the women physicians and surgeons of America demonstrated their fitness for war-time service during the first World War when they raised funds, financed units and staff hospitals with well-trained officers in France and Serbia, and did heroic work in the devastated areas, and thereby proved that sex does not count in times of national emergency and national defense, but that ability and skill do, and

WHEREAS, the government has already granted women nurses army rating with proper rank, pay and war-risk insurance and

WHEREAS, the members of the American Medical Women's Association are for the most part members of the American Medical Association, pay the regular dues and enjoy all of the privileges of full membership,

THEREFORE BE IT RESOLVED, That the Minnesota State Medical Society recommend that women physicians and surgeons of America become eligible for the Medical Reserve Corps of the United States Army and Navy, and be granted full privileges, and

BE IT FURTHER RESOLVED, That the Minnesota State Medical Society instruct their delegates for the House of the Delegates of the American Medical Association. That this resolution shall be laid before the House of Delegates of the American Medical Association for their favorable consideration at the annual meeting at Cleveland in June, 1941.

After discussion it was moved, seconded and carried by rising vote to adopt the resolution.

Doctor Sogge then presented the report of the Committee on Public Policy. The report was not recorded and neither were the remarks in comment made by Mr. F. Manley Brist, attorney for the Association.

Considerable discussion by delegates praising the work of the committee followed but was not recorded. It was then moved, seconded and carried that the report be adopted.

Dr. A. W. Adson proposed that the House of Delegates go on record officially as opposed to the type of medical practice by which a physician is hired by a fraternal order to care for members of the order, in which the members are deprived of free choice of physician and the physician is responsible to the order and not to the individuals served.

It was moved, seconded and carried that this was the official attitude of the delegates on this matter.

Dr. E. M. Hammes then gave the report of the Committee on Medical Testimony as follows:

COMMITTEE ON MEDICAL TESTIMONY

In order to conduct a thorough and just investigation when a physician practicing in Minnesota is accused of giving vicious or dishonest medical testimony in any court of this state, several important factors are essential:

1. The judge, or attorney, or accusing physician must submit in writing a brief statement to the Committee, giving the name of the physician who is to be investigated and also the names of the principals of the trial in order that a transcript of the entire testimony can be obtained.

During the past year, four definite and glaring reports of very questionable medical testimony have been submitted unofficially to your chairman by members of the State Medical Association. However, in only one instance was the complaint submitted in writing and this case is in the process of investigation. In the other three cases, a complaint in writing was requested, but refused for various reasons.

2. A transcript of the entire testimony of the case in question must be obtained and placed at the disposal of our Committee. Only by this method will the Committee be able to obtain a true knowledge of all the facts to enable them to arrive at an unbiased and just opinion.

The expense incurred to obtain a transcript of a three (3) day trial in District Court is approximately $100.00. In the Industrial Commission, a similar transcript wil cost about $75.00. The Council of our State Medical Association has approved these expenditures.

3. To assist the Committee on Medical Testimony, members of the State Association in the various specialties must be willing to appear before the Committee when requested to do so and express their opinion regarding the testimony in question.

Your Committee has no disciplinary or judiciary power. If on thorough investigation, the Committee decides that sufficient facts have been presented so that definite action should be brought against the physician accused, all the pertinent facts will be submitted to the State Board of Medical Examiners which has the legal authority to censure or even revoke the medical license.

The Minnesota State Medical Association is the pioneer in this movement of raising the standard of Medical Testimony. Neighboring state medical societies. Wisconsin, Illinois and others are manifesting a definite interest.

We have the full coöperation of the Judges of the Supreme Court, District Court and of the Minnesota State Bar Association.

Your Committee needs your fearless and courageous support.

E. M. HAMMES, *Chairman*

At the request of the Speaker, Doctor Hammes explained that five men in special fields had been asked to assist the Committee in its deliberation; that Justice Stone, to whom he had applied for advice, was of the opinion that complaints might legitimately be made to the Committee by any judge, attorney, physician or even a layman and that the Committee had authority to act on the complaints if, after sufficient investigation, it found sufficient grounds for inquiry. He said the Committee was unwilling to act in any case unless the complaint is made in writing. The Committee is an important one, he said. It is the first and only body of its kind in the United States and it is the hope of all who are interested that it may operate to the improvement of medical testimony in Minnesota. It is realized that to report cases to the Committee may cause considerable embarrassment both to the one who

reports and to the Committee; but it must be done if the work is to have value. It is the hope of everybody that needed investigations may be rare and that a few will suffice to have a satisfactory effect.

Dr. B. S. Adams said that the Minnesota State Bar Association had appointed a committee independently and that the committee, of which Justice Royal A. Stone was a member, was very happy to meet with our committee when they were informed that we had already appointed a group to study the matter. "We have the best possible coöperation, therefore, from the Bench and Bar of the state," he said. "I have known personally of two occasions during the years of my practice when a doctor went out of his way to give testimony favorable to the litigant who was paying his fee. That is a disgrace to the profession and we cannot stand for it. Some ten years ago consideration was given to asking for a change in judicial procedure. We were advised that this is a better way to go about improving the situation but we must have coöperation to get results. The Committee is on the spot; it has a tough job ahead of it but with wholehearted backing it should produce results. The disciplinary powers of the State Board of Medical Examiners are effective. They will operate to curb false medical testimony also if the Committee is permitted to function completely in investigating suspicious cases."

It was moved, seconded and carried to adopt the report.

Doctor Will then called on Dr. J. F. DuBois, secretary of the State Board of Medical Examiners, whose remarks were not recorded.

Discussion on the status of interns in relation to the Medical Practice Act followed.

Speaker Will then called for a report from Dr. A. J. Chesley, secretary and executive officer of the State Board of Health.

Doctor Chesley called attention of the delegates to the position of the State Board of Health with reference to legislation and appropriations and expressed his disappointment that the Legislature failed to pass an appropriation for the research now being carried on by a division of the Board in industrial health. The work has been supported by funds supplied under Title Six of the Social Security Act and will undoubtedly increase in importance with the development of defense industries. He pointed out also the difficulties ahead of the Board in maintaining trained personnel in view of the continuing call to service of reserve medical officers and particularly in the case of industrial health work, in which few in the United States have the qualifications such as those of Doctor Foker, the present head of the Division of Industrial Health, to fit them for this important work. Doctor Foker is a Reserve Officer and subject to call. In any case, the work must go on.

In connection with legislation introduced at the last session of the Legislature, Doctor Chesley expressed his gratification that the bill, designed to further centralize and streamline the state government by abolishing the independent State Board of Health, failed to pass. He recalled that the bill which established the Board in 1872, third in the United States, was passed through the effort of the Minnesota State Medical Association and that the Board had continued in close coöperation with the Medical Association ever since, especially when the Social Security Act was passed and new federal funds became available. The Board then asked that the Council act in an advisory capacity on all new programs thus made possible and this advisory relationship has been continued without interruption.

He commented on two new bills involving the Board in new responsibilities which passed the Legislature. One of them, the licensure of rest homes, goes into effect January 1 and there will be an opportunity to get the assistance of your committee and others to set up the standards and the machinery for putting it into effect.

The other bill requires the Board to license school bus drivers, or some individual who accompanies the driver, as trained in First Aid and also that each school bus or vehicle used to transport children to school have stipulated equipment, including first aid supplies, blankets and splints. The bill was pushed through the Legislature at the last minute and became the law immediately but the difficulties of making it effective are obvious when you consider that there are an estimated 5,000 school busses in the state running all the way from standard busses with two drivers to private drivers taking their own and the neighbors' children to school under a contract arrangement. Also it has been estimated that it will cost as much as $30.00 for equipment for each bus in addition to the license fee and there is the problem of how to keep people who have been awarded a certificate by the Board in First Aid from exceeding their prerogatives and practicing medicine. In that case, you will have people doing things that ought not be done and the result may even be worse than if no first aid were available.

Doctor Chesley said in conclusion it was his opinion that the problems of the past are probably of small consequence compared to the issues which all are going to have to face in the near future. The Board relies on the intelligent coöperation of the Association as never before.

Doctor Will called for the Necrology report and members of the House of Delegates rose in tribute.

After announcements about the luncheon meeting of the delegates and the National Committee on Physicians Monday, the House adjourned until Monday after the luncheon.

Monday P.M. Session

Doctor Will called the meeting to order at 2:00 p.m. and, upon being assured by Dr. F. J. Lexa, chairman of the Credentials Committee, that a quorum was present, asked for the report of Doctor Giffin, chairman of the Council.

Doctor Giffin: The Council met with and discussed hospitalization problems of joint interest with the Minnesota Hospital Service Association Sunday night and met again in the morning to consider chiefly the report of activities of the National Committee of Physicians and of the A.M.A. trial made by Doctor Braasch. Certain other business was considered however. An official expression of regret at the departure of Doctor C. A. Stewart, Councilor for the Sixth District, who is leaving to assume the chair of Pediatrics at Louisiana State University, was made by the Council with appreciation especially for his great service to the Association as Councilor.

The resolution concerning dues of members called to military duty passed by the House last night and referred to the Council for final action, was discussed and approved with this additional recommendation:

"That no component medical society should be advised to take advantage of the provision for payment of dues out of state funds unless the financial condition of that society should make it imperative. On the other hand, if the local situation should thus make it imperative, the society concerned should feel no hesitancy in making such an appeal to the Council for aid."

The whole question of proper qualifications in cities of the first class for coroner was discussed and has been referred for study to the Committee on State Health Relations and will be reported back to the Council at an early meeting.

It was moved, seconded and carried to accept Doctor Giffin's report.

Doctor Sogge then inquired if there was a report for the delegates on the request for aid in securing passage

of a new bill governing the State Board of Nursing Examiners which had been referred the night before to the Committee on Interprofessional Relationships.

Dr. R. G. Allison, chairman of the Interprofessional Relationships Committee: Only three members of the Committee have been able to get together on this matter since last night's meeting. We have prepared a statement for the House pointing out that, inasmuch as only a few members were available for consultation and time was short, it seemed inadvisable to make any recommendations at this time on passage of such a bill. It would be the privilege of the Committee, the statement declared, to investigate carefully the merits of the proposed bill and further determine as far as possible, the effect its passage might have on the practice of medicine, the practice of nursing and the welfare of patients involved. Copies of all correspondence involved will be sent to all members of the Committee to enable them to carry on independent studies also. When the investigation is completed, a special meeting will be called and the final report submitted to the delegates at the next meeting.

It was moved and seconded that the report of the Committee be accepted.

Doctor Gullixson spoke to the delegates again on the nursing problem of the smaller hospitals and after considerable discussion the motion to accept the report was carried.

On suggestion of Doctor Adson and others it was also moved, seconded and carried that a joint meeting be called of members of the Interprofessional Relationships Committee, the Minnesota Hospital Association, the Board of Nursing Examiners and leaders of other nursing groups so that all may understand full the problem of supplying nurses for rural needs.

Doctor Will then called on Doctor Giffin to present the proposal to revise the by-laws for the purpose of adjusting the existing committee structure.

Doctor Giffin said that the Council and Reference Committee had approved the suggested changes with one small alteration. The suggested revision provides chiefly for the removal of certain subcommittees from the Committee on Public Health Education and making them separate scientific committees to be appointed, as in the case of other scientific committees, by the president. In detail the changes are as follows:

"Pages 16 and 17, having Committee on Industrial Health deleted; Committee on Fractures made a separate committee. Committee on Asphyxia and Asphyxial Death changed to the Committee on Anesthesia and Asphyxia; Committee on Industrial Hygiene and Occupational Diseases was added; Committee on Public Health Nursing was made a separate committee; Committee on Schools for Laboratory Technicians was deleted. I might say that this Committee had been inactive for a couple of years and is covered by another committee. The Committee on Maternal Welfare was changed to the Committee on Maternal Health. Adding to the Scientific Committees, Tuberculosis, First Aid and Red Cross and Child Health, which were formerly subcommittees of Public Health Education Committee, leaving under the Committee on Public Health Education, the Executive Committee, the Speakers' Bureau the Radio and the Editorial Committee—all relating to the public. The Executive Committee of the Public Health Education Committee would then consist of the Chairmen of the Subcommittees and in addition the Chairmen of all the Scientific Committees so that the Scientific Committees will have contact with the Public Health Education Committee.

"On Page 25, adding the Subcommittee on Sickness Insurance; on Page 26, County Contact Committee had its name changed to County Medical Advisory Committee. The Committee decided that the following committees should be made permanent scientific committees, the new Committee on Medical Testimony, Industrial Hygiene and Occupational Diseases, Vaccination and Immunization. A slight change was made in reading concerning the County Medical Advisory Committee to read as follows:

" 'It shall consist of three physicians practicing in the county in which they live and members shall be elected at least annually by the county socities or by members of the profession within the county. Vacancies shall be filled by the Executive Committee of the component society with the advice of the Councilor within the district. Their function shall be to study the medical and health problems so far as they are related to the best interests of the public and coöperate with their component societies and the State Medical Economics Committee and all public agencies in their own county.'

"My suggestion would be that this can be adopted if you so desire with instructions to the Council to complete the necessary re-writing of the by-laws."

Discussion brought out the fact that the old "Contact Committees," so-called, are to be known as "Medical Advisory Committees"; that they are to be elected or appointed in each county, at least annually (so as not to disturb the arrangement in existence in some counties of appointing members to serve alternately for periods of three months). It was also pointed out that in one society it might be necessary to change the name of the society's executive committee, now known as "the medical advisory committee," in order that it may not be confused with the county medical advisory committees.

It was moved, seconded and carried that the report be accepted and that the by-laws be changed as outlined.

Dr. Will then called for a further report of finances from Dr. Giffin.

Dr. Giffin: Some questions were raised in the discussion of payment of dues for members called to military duty and as to the investment fund of the state association. It seemed to me that the delegates might wish to know the exact status of that fund.

You will be glad to know, I'm sure, that the finances of your organization are in very good condition. The last monies transferred to the Investment Advisory Agency previous to 1938 were transferred in 1928. There was thus a period of ten years when there were no savings sufficient to warrant a transfer. During that time the amount increased by interest from approximately $21,000 to $32,000. In 1937, when the present administrative staff took over, we were in the red to the amount of several thousand dollars. That amount was made up and by 1938 we transferred $4,000 to the Investment Agency Fund; in 1939, we transferred $4,000 and in 1940, $6,000. The amount has thus grown to a cost value of $48,000. The cash market value is in the neighborhood of $45,000. The Agency Account is well invested with only one item, the Nicollet Avenue Properties, which has shown any marked depreciation. We have obtained interest on all our investments. Anyone interested in seeing the details is invited to see the report of the Fiscal Agency Account of our Association, which is managed by the First National Bank and Trust Company of Minneapolis.

Since 1937, when Mr. Rosell and his staff took over management of our Association, it has been possible to pay all expenses of our annual meetings out of exhibit receipts and return various amounts of profit to the General Fund. In other words, the exhibit of each year more than pays for all the expenses of the meeting. Under the present arrangement all administrative work is done in the state office by the regular staff, which is an important element in our savings. We all recognize the efficiency of our full time office staff.

I don't know how our finances will come out this year. It has been an unusually expensive year but it looks as though there would be a slight profit.

I believe that an organization of this sort should have a reserve of at least $100,000. Such a reserve would yield an annual interest of $3,000, something we could count on to finance special projects in our program. Let us keep the Association in good financial condition.

Doctor Will then called for a further report from the Committee on Resolutions. Dr. A. H. Sanford, Chairman.

Doctor Sanford proposed the following resolutions,

all of which were adopted unanimously by the delegates.

Five distinguished out of state speakers have appeared before this convention through the courtesy of the following special societies: Northwestern Pediatric Society, Minnesota Radiological Society, Trudeau Society, the Northern Minnesota Medical Association and the St. Paul Clinical Club.

In sponsoring these speakers the special societies have made an inestimable contribution to our meetings which is gratefully acknowledged by this House. The presence of two other notable guests on this program was made possible by the Great Northern and the Northern Pacific railroads. The appreciation of this House is extended also to the officials of these railroads.

* * *

Most of the credit for the fine arrangements made for this meeting goes to our host Society, the Ramsey County Medical Society, and its active local arrangements committee under the chairmanship of Dr. Francis W. Lynch. To Doctor Lynch and his committee the House of Delegates in session here expresses its warm appreciation for their work.

* * *

The House of Delegates wishes to express its obligation to the Minneapolis, Saint Paul, and Duluth papers, including the *Minneapolis Star Journal*, the *St. Paul Dispatch and Pioneer Press* and the *Duluth Herald and News Tribune* for their excellent reporting of scientific sessions held in connection with the meeting of the Minnesota State Medical Association in St. Paul and for their generous contribution of space to advance announcements. The importance of accurate reporting of medical news is well recognized by the members of this House and the coöperation of these newspapers is thoroughly appreciated.

* * *

Radio time for broadcasts by distinguished guest speakers has been generously provided by WCCO and KSTP and affiliated stations. These broadcasts contributed much to the interest and value of the meeting of the Minnesota State Medical Association in St. Paul and the warm thanks of the House of Delegates to stations WCCO and KSTP and associates is hereby extended.

* * *

WHEREAS, the Minnesota State Board of Medical Examiners has achieved a national reputation and an outstanding record for its conscientious and impartial administration of our medical practice act of Minnesota and

WHEREAS, through its work, the unlicensed quacks and cultists who formerly flourished in Minnesota have been virtually eliminated and

WHEREAS, in so doing, members of the Board have worked closely with the physicians of the state in their joint effort to protect the public health,

BE IT THEREFORE RESOLVED, That the House of Delegates hereby express its appreciation to the Board and its members for their splendid contribution to the public welfare in Minnesota and also for their constant coöperation with the practicing physicians in their joint efforts to protect the public health.

* * *

WHEREAS, the State Board of Health and its staff have continued to work closely with the Minnesota State Medical Association and the physicians of the state in the promotion of joint programs for the public health in this state and

WHEREAS, the interests and standards of medicine have been carefully guarded by responsible officers in all plans for new programs made possible by federal funds and

WHEREAS, the facilities of the Board have been placed at the disposal of the Medical Association especially in the Subject-of-the-Month program of the Association.

BE IT THEREFORE RESOLVED that this House again expresses its appreciation to the Board, to Dr. A. J. Chesley, its executive officer, and to his staff for their aid and coöperation in our work and for their recognized leadership in all departments of public health.

There being no further new business to come before the House, the Speaker then called for election of officers, asking first for nominations for the office of President-elect.

Dr. A. W. Adson then placed in nomination the name of *Dr. H. Z. Giffin* of Rochester for *President-elect.* There being no other nominations, it was moved seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Doctor Giffin.

At the request of the Speaker, Doctor Giffin expressed his appreciation for the confidence and kindliness of the vote. He said his emotions were a little mixed because this election meant that he would leave the Council and he has enjoyed the association with the Council very much. The Council, he said, is a very remarkable body of men. In his opinion, no finer body exists anywhere for loyalty, honesty and fair judgment. However, he appreciated the honor very much and he will be happy to carry out the wishes of the Council and the House of Delegates to the best of his ability as president of the Association.

Dr. Norman H. Baker of Fergus Falls was then nominated for *First Vice President* and, there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary cast a unanimous ballot for Doctor Baker as First Vice President.

Dr. S. B. Haessly of Faribault was nominated for *Second Vice President* and, there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary cast a unanimous ballot for Doctor Haessly for Second Vice President.

Dr. B. B. Souster of Saint Paul was nominated to succeed himself as *Secretary.* There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the executive secretary be instructed to cast a unanimous ballot for Doctor Souster as Secretary.

Dr. W. H. Condit of Minneapolis was nominated to succeed himself as *Treasurer* and, there being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Doctor Condit as Treasurer.

Dr. W. W. Will of Bertha was nominated to succeed himself as *Speaker* of the House of Delegates. (Dr. E. A. Meyerding of Saint Paul, vice speaker of the House, assumed the chair.) There being no further nominations, it was moved, seconded and carried that the secretary be instructed to cast a unanimous ballot for Doctor Will as Speaker of the House of Delegates. (Doctor Will then resumed the chair.)

Dr. E. A. Meyerding was nominated as *Vice Speaker* of the House and, there being no further nominations, it was moved, seconded, and carried that the secretary be instructed to cast a unanimous ballot for Doctor Meyerding as Vice Speaker of the House.

Doctor Will then called for nominations for Councilors to fill offices of Councilors whose terms expired.

Dr. L. A. Buie of Rochester was nominated to succeed Doctor Giffin as *Councilor of the First District* and, there being no further nominations, it was moved, seconded and carried that the secretary be instructed to cast a unanimous ballot for Doctor Buie as Councilor of the First District.

Dr. L. L. Sogge of Windom was nominated to succeed himself as *Councilor of the Second District* and, there being no further nominations, it was moved, seconded and carried that the secretary be instructed to cast a unanimous ballot for Doctor Sogge as Councilor of the Second District.

Dr. F. J. Elias of Duluth was nominated to succeed himself as *Councilor of the Ninth District.* There being no further nominations, it was moved, seconded and carried that the secretary be instructed to cast a unanimous vote for Doctor Elias as Councilor of the Ninth District.

Dr. S. H. Baxter of Minneapolis was nominated to fill out the unexpired term of Dr. C. A. Stewart, who resigned as *Councilor of the Sixth District* to go to the University of Louisiana. There being no further nominations, it was moved, seconded and carried that the secretary be instructed to cast a unanimous ballot for Doctor Baxter as Councilor of the Sixth District.

Doctor Will then presented the nomination by the Council of *Dr. F. J. Savage* of St. Paul to succeed himself as *delegate to the American Medical Association.* There being no further nominations, it was moved, seconded and carried that the secretary be instructed

to cast a unanimous ballot for Doctor Savage as delegate to the American Medical Association. The nomination by the Council of *Dr. George Earl* of St. Paul as *alternate* to Doctor Savage was presented to the House and, there being no further nominations, it was moved, seconded and carried that a unanimous ballot be cast for Doctor Earl as alternate to Doctor Savage.

The nomination by the Council of *Dr. A. W. Adson* of Rochester as *delegate to the American Medical Association* to fill out the unexpired term of Dr. W. F. Braasch of Rochester, recently appointed as trustee to the American Medical Association, was presented to the House. There being no further nominations, it was moved, seconded and carried that the secretary be instructed to cast a unanimous ballot for Doctor Adson as delegate, in the place of Doctor Braasch, to the American Medical Association.

The nomination by the Council of *Dr. J. M. Hayes* of Minneapolis to the office of *additional delegate,* made possible by reapportionment of delegates from the American Medical Association, was presented to the House. There being no further nominations, it was moved, seconded and carried that the nominations be closed and that the secretary be instructed to cast a unanimous ballot for Doctor Hayes as delegate to the American Medical Association.

Nomination by the Council of *Dr. W. W. Will* as *alternate* to Doctor Hayes was presented to the House. (Doctor Meyerding assumed the chair.) There being no further nominations, it was moved, seconded and carried that the secretary be instructed to cast a unanimous ballot for Doctor Will as alternate to Dr. Hayes. (Doctor Will resumed the chair.)

Doctor Will then called for suggestions as to the place for the 1942 Annual Meeting.

Dr. L. A. Barney of Duluth, on behalf of the St. Louis County Medical Society, invited the association to meet in Duluth in 1942. It was moved, seconded and carried that the invitation be accepted.

Doctor Will: There has been a suggestion that the end of May is sometimes a difficult time for the meeting, inasmuch as many fathers wish to attend graduation exercises at that time. I believe the date in Duluth will be later in the summer so as to be sure of warm weather and that will take care of the matter for 1942.

Doctor Will announced the entertainment at which members were to be guests of the Ramsey County Medical Society and the Minnesota State Medical Association at the Auditorium in the evening and asked for further business before adjournment.

Doctor Giffin asked for a vote of thanks to the administrative staff for their work of the last few years.

It was moved, seconded and carried that a rising vote of thanks be given to the staff for its work.

Dr. Hayes: I don't believe the meeting should adjourn without saying something about the work of the National Committee of Physicians. As representative of Dr. Savage, state chairman, who is attending another meeting, I want to move that every county or component society appoint a chairman to take charge of the work of the committee so that we can keep up the enthusiasm aroused at the luncheon meeting today.

The motion was seconded and delegates from St. Louis County, Red River Valley, Renville, Clay-Becker and other societies reported contributions from members or the society as a whole to the work.

Dr. Will said that without question the committee is doing a most valuable work and if it costs a little money, it should be the duty of all members to give the money and keep enthusiasm alive for the movement.

The motion was carried and the meeting adjourned.



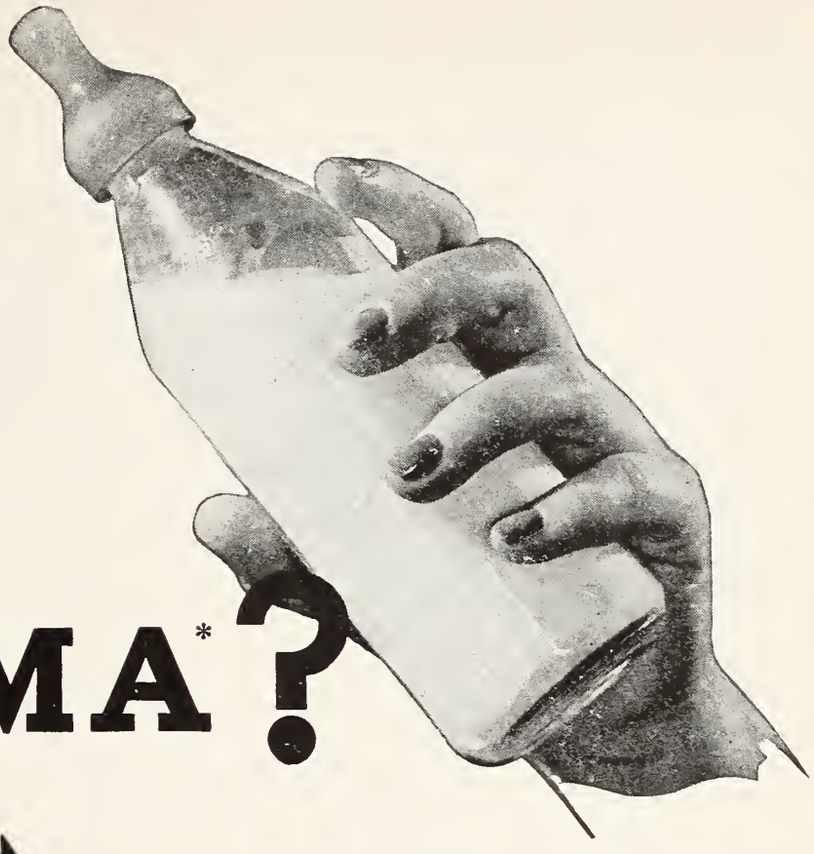
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OF GENERAL INTEREST

Dr. Edward J. Harri has become associated in practice with Dr. John K. Butler at Carlton.

* * *

Dr. Lawrence J. Kaasa of Albert Lea was recently appointed a member of the board of the Mineral Springs Sanatorium.

* * *

Dr. Ralph K. Ghormley of Rochester was elected president of the Clinical Orthopædic Society at a recent meeting in Akron and Cleveland.

* * *

A continuation course in medical technology was presented at the University of Minnesota Center for Continuation Study, October 20, 21 and 22.

* * *

Dr. Wallace H. Cole of Saint Paul discussed "Some Recent Medical and Surgical Experiences in England" before the Chicago Orthopedic Society, October 10.

* * *

Dr. Stuart D. Whetstone, who has been practicing in Owatonna since last March, has moved his family to Cut Bank, Montana, where he will resume his practice of medicine.

Dr. W. P. Olson, who has been in Los Angeles, arrived in Gaylord recently to assist his son, Dr. D. C. Olson at the Gaylord hospital.

* * *

Dr. Miland E. Knapp of Minneapolis was elected second vice president of the American Congress of Physical Therapy at the annual meeting in Washington, D. C., September 1-5.

* * *

At the twenty-fourth annual meeting of the American Dietetic Association held in St. Louis, October 20-23, Dr. Russell M. Wilder of Rochester spoke on "Nutrition and National Defense."

* * *

Among those recently issued appointments by the Navy Department as Assistant Surgeons in the Navy with the rank of lieutenant (junior grade) are: Drs. Robert D. Blomberg, Andrew E. Morrison and Robert W. Wheeler of Minneapolis.

* * *

Dr. Paul M. Gamble of Albert Lea is doing graduate work in surgery at the New York Polyclinic Medical School and Hospital in New York City. He began his

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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

A complete technique of treatment and literature will be sent upon request

*Silver Picrate is a definite crystalline compound of silver and picric acid. It is available in the form of crystals and soluble trituration for the preparation of solutions, suppositories, water-soluble jelly, and powder for vaginal insufflation.

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work there about October 1 and expects to remain there three months.

* * *

The marriage of Dr. Arthur J. Moss of Minneapolis and Miss Alice Litman of Saint Paul took place October 19. Both are graduates of the University of Minnesota, where Dr. Moss was affiliated with Phi Delta Epsilon, professional medical fraternity.

* * *

Dr. Stanley J. Smith, a member of the More Hospital staff in Eveleth since 1937, has moved his family to Belvidere, Illinois, where he has entered private practice. Dr. Smith was honored at a farewell party by the Eveleth Elks lodge, September 27.

* * *

Included on the program for the fifty-second annual meeting of the Association of Life Insurance Medical Directors of America, held in New York, October 23-24, was Dr. Edgar V. Allen of Rochester, whose subject was "Peripheral Arterial Diseases."

* * *

Dr. J. L. McKelvey, head of the department of obstetrics and gynecology at the University of Minnesota medical school, will address a meeting of the Southern Medical Association to be held in St. Louis, Missouri, November 11-14.

* * *

Dr. Edith Boyd has resigned her position as assistant professor of anatomy and child welfare at the University of Minnesota to go to White Fish, Montana, to become director of the general hospital there. She assumed her new duties, October 15.

* * *

Among the speakers for a course of postgraduate lectures on geriatrics to be given at Marquette University school of medicine this month under the sponsorship of the Medical Society of Milwaukee County is Dr. Oscar T. Clagett of Rochester. His topic is "Treatment of the Aged from the Surgical Angle."

* * *

Captain Henry B. Clark, Jr. (Saint Paul) was recently appointed to take charge of faciomaxillary surgery at Camp J. T. Robinson, Arkansas, where he has been on active duty since December 12, 1940. More recently his term of active duty has been extended to December 12, 1942.

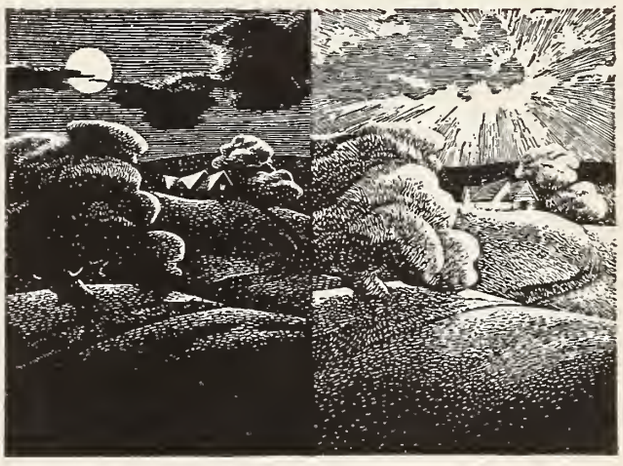
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Dr. W. J. Marcley is acting as temporary consultant in the tuberculosis work of the Minnesota State Board of Health during the absence of Dr. Hilbert Mark, who was called to active service with the United States Army in August. Dr. Mark, who holds the rank of major, is stationed at Camp Grant.

* * *

Dr. Jay Arthur Myers of Minneapolis delivered the George C. Rowell Memorial Address at a dinner meeting in Beckley, West Virginia, which was part of a joint meeting of the sixth councilor district of the West Virginia Medical Association and the West Vir-

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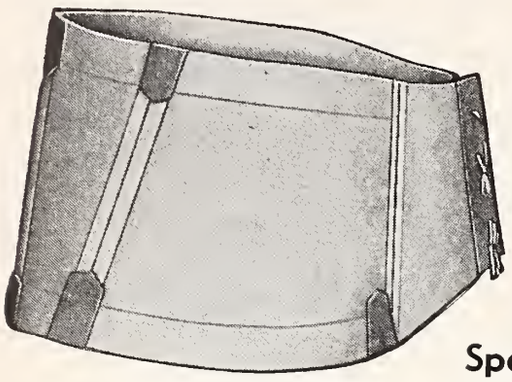
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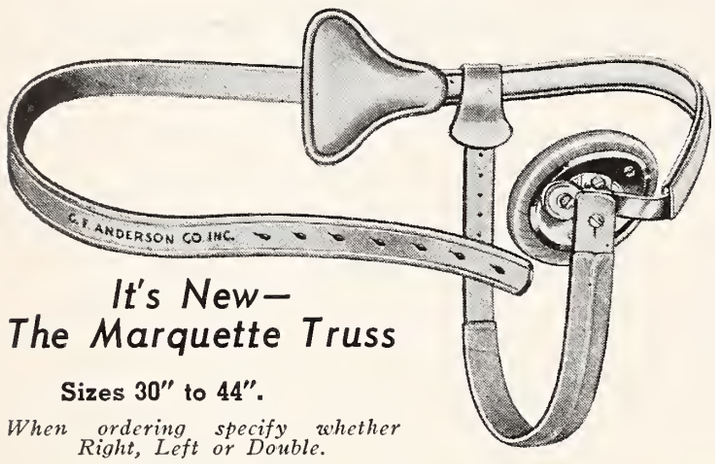
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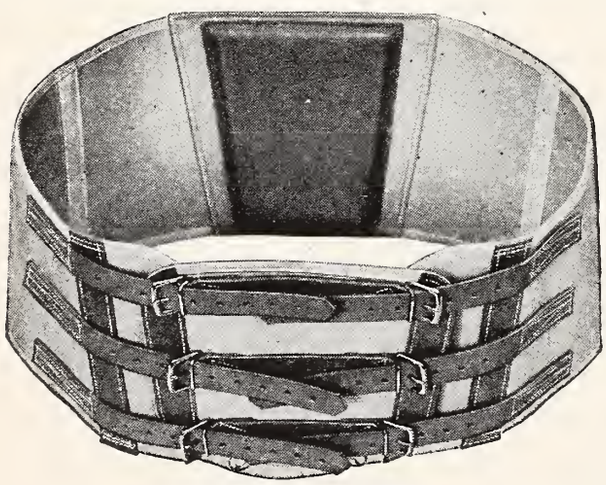
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* * *

Dr. and Mrs. Hjalmar Mortensbak and son of Hanska moved recently to Minneapolis, where Dr. Mortensbak has become associated with General Hospital as a resident in surgery. A graduate of the University of Minnesota Medical School, '34, Dr. Mortensbak interned at General Hospital and then went to Hanska to practice.

* * *

The Mayo Foundation announces that a series of lectures, demonstrations and clinics by members of the faculty and invited guests will be held in Rochester during the week of November 10. Problems related to medical and surgical emergencies encountered in civilian and military practice will be emphasized. Physicians are invited to attend.

* * *

Dr. Arthur Neumaier has opened offices in Glencoe, Minnesota. A graduate of Duke University medical school, he interned in children's diseases at the University of Chicago Clinics and at St. Mary's Hospital in Duluth. For the past three and a half years, he has practiced at Lindstrom. He recently was released from active duty with the United States Army medical corps.

* * *

Two members of the University of Minnesota medical staff have recently published books.

Dr. Wesley W. Spink, associate professor in medicine, is the author of "Sulfanilamide and Related Compounds in General Practice," while Dr. Wallace P. Ritchie, clinical assistant professor of surgery, has written a book entitled, "Essentials of General Surgery."

* * *

Dr. Oscar T. Heyerman has become associated with the Warren Clinic in Warren. He replaces Dr. John D. Barker, who has been called to service in the medical corps of the United States Army. Dr. Heyerman is a graduate of the University medical school. He served his internship at Ancker Hospital, and for several months past was a resident at Northwestern Hospital in Minneapolis.

* * *

A paper will be presented at the Central Society for Clinical Research, which meets in Chicago, November 7-8, by Dr. Wesley W. Spink, associate professor of medicine at the University of Minnesota Medical School. His subject will be "The Coagulase Test for Staphylococci and its Correlation with the Resistance of the Organisms to the Bactericidal Action of Human Blood; Clinical and Immunological Significance."

* * *

Drs. Russell O. Spittler and T. J. Bloedel have announced their association in the practice of medicine and surgery at New Richland, Minnesota. Dr. Spittler has been practicing in New Richland since January, 1940, and Dr. Bloedel came to New Richland in May, 1941, to take over Dr. Spittler's practice during the latter's

service with the army. Dr. Spittler, however, was released from service.

* * *

Dr. John C. Poore of Saint Paul has taken over the practice of Dr. Donald Brink at Isle. Dr. and Mrs. Brink and their son left recently for New York City where Dr. Brink will study at the New York Polyclinic Medical School and Hospital.

Dr. Poore, who is a graduate of the University of Minnesota School of Medicine, was lately in practice in Nevada.

* * *

Dr. William H. Haines, a graduate of the University of Minnesota medical school, Class of 1932, has been appointed director of the Behavior Clinic of the Criminal Court of Cook County in Chicago, Illinois. This clinic passes on the sanity of prisoners brought up for trial before the Criminal Court. Dr. Haines also is assistant professor of neurology at Rush Medical College.

* * *

Speakers at the eleventh annual conference of the Oklahoma City Clinical Society held October 27-30 at Oklahoma City included Dr. Gilbert J. Thomas, clinical associate professor of urology at the University of Minnesota medical school and clinical professor of surgery at the graduate school; Dr. Walter C. Alvarez of Rochester; and Dr. Fred W. Rankin of Lexington, Kentucky, formerly of Rochester, president-elect of the American Medical Association.

Appearing on the program for the meeting of the tenth district of the State Medical Society of Wisconsin at Eau Claire, September 25, were: Dr. Cecil J. Watson of Minneapolis, whose subject was "Uremia"; Dr. Ernest M. Hammes, Saint Paul, "Diagnosis of Spinal Cord Diseases"; and Dr. Albert M. Snell, Rochester, "Portal Cirrhosis." Dr. Watson also conducted a clinic, and Dr. Hammes gave a dinner address, "Believe It or Not in Medicine."

* * *

Dr. W. A. O'Brien, director of postgraduate education at the University of Minnesota medical school, addressed members of the Elk River Chamber of Commerce, October 16, on the subject of pasteurized milk. The program was arranged by Dr. Arthur B. Roehlke and Dr. Gordon H. Tesch of Elk River.

The meeting was part of a campaign relating to pasteurization of milk, which is being sponsored by the East Central Minnesota Medical Society.

* * *

Married in Minneapolis, October 18, were Dr. Hanns C. Schwyzer, son of Dr. and Mrs. Arnold Schwyzer of Saint Paul, and Miss Margaret Nelsen, daughter of Mr. and Mrs. N. G. Nelsen of Minneapolis.

Ushers included Dr. Charles Rea and Dr. Arnold Schwyzer of Saint Paul.

Dr. and Mrs. Schwyzer are at home at Pippens Place, a lodge in the Ozarks. Dr. Schwyzer, a lieutenant in the army medical corps, is stationed at Fort Leonard Wood, Missouri.

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OTOLARYNGOLOGY—Two Weeks' Intensive Course will be offered twice during the year 1942, dates to be announced. Clinical and Special Courses starting every week.

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On the program of the thirteenth annual meeting of the Aero Medical Association of the United States in Boston, October 31-November 2, were Drs. William R. Lovelace, II, and Jan H. Tillisch of Rochester, whose paper was entitled, "The Physical Maintenance of Transport Pilots."

Dr. Albert J. Herbolsheimer, assistant chief of the medical section of the Civil Aeronautics Administration, Washington, D. C., participated in a forum on civil aeronautics. Dr. Herbolsheimer was formerly of Minneapolis.

* * *

Guest speakers on the program for the course in radiology of the chest given at the Center for Continuation Study on the University of Minnesota campus, November 3, 4 and 5 included Dr. Fred J. Hodges, head of the department of roentgenology at the University of Michigan; Dr. Carl C. Birkelo, roentgenologist at Herman Kiefer Hospital and William H. Maybury Sanitarium in Detroit, Michigan; Dr. Wendell G. Scott of the department of roentgenology at Washington University, St. Louis; and Dr. S. Reid Warren, Jr., Moore School of Engineering, X-ray Laboratory, University of Pennsylvania, Philadelphia.

* * *

Four important national defense research projects are under way in the University of Minnesota Medical School, Dr. Harold Diehl, dean of the school, reports.

The investigations include a study of nutrition and diets for soldiers being made by Dr. Ancel Keys, university physiologist, who is helping the Army develop new rations; research into the effects of low oxygen pressure on the heart—of military significance from an aviation standpoint; study of the concentration and preservation of blood serum as well as work on finding blood substitutes; and investigation into the effects of poisonous gases on pulmonary physiology.

* * *

Guest speakers at the ninth annual assembly of the Omaha Mid-West Clinical Society in Omaha, October 27-31, included: Dr. John L. McKelvey, Minneapolis, "Etiology and Treatment of Premature Separation of Normally Implanted Placenta," also "Arteriosclerotic Toxemia of Pregnancy"; Dr. Albert M. Snell, Rochester, "Recent Advances in Vitamin Therapy," also "Supposedly Rare Conditions Producing Abdominal Pain"; and Dr. Byrl R. Kirklin, Rochester, "Early Manifestations of Gastro-intestinal Cancer."

Dr. Kirklin also took part in a symposium on radiologic diagnosis, as did Dr. Leo G. Rigler of Minneapolis.

* * *

The twenty-first anniversary of the founding of the Northwestern Clinic in Crookston was marked by a dinner for members of the staff, October 11.

The clinic opened its doors October 10, 1920, with a staff of three members, Dr. M. O. Oppegaard, Dr. C. D. Mitchell and the late Dr. O. E. Locken. Dr. C. L. Oppegaard joined the staff in 1924; Dr. L. L. Brown in 1926; Dr. W. F. Mercil in 1928; Dr. C. G.

Uhley and Dr. R. O. Sather in 1937, and Dr. R. S. Derifield in 1941. Dr. Sather is now active in military service as a major in the medical corps at William Beaumont general hospital in El Paso, Texas.

A new addition to the clinic building, which will double its facilities, is now under construction.

* * *

Dr. Herman E. Hilleboe of Saint Paul, chief of the medical unit of Minnesota's Division of Social Welfare, presented a paper, "Tuberculosis Among Mentally Ill Patients" at the annual convention of the American Public Health Association in Atlantic City, New Jersey, held there October 11-17.

Representing the University of Minnesota medical school at the meeting were Dr. Gaylord W. Anderson and Dr. Ruth E. Boynton; while Dr. A. J. Chesley and Dr. R. N. Barr represented the Minnesota State Board of Health. Dr. Anderson was named vice chairman of the epidemiology section, and Miss Laura A. Draper, director of Minneapolis Community Health Service, chairman of the public health nursing section.

* * *

Former interns and fellows in pediatrics at the University Hospitals held a reunion, their first, on the University of Minnesota campus, October 17-18.

Dr. Willis H. Thompson of Minneapolis was named chairman of a permanent committee to plan future reunions.

Among those from outside the Twin Cities who attended were: Drs. Paul Bancroft and R. R. Remboldt, Lincoln, Nebraska; Dr. George B. Logan, Rochester; Dr. R. E. Dyson, Minot, North Dakota; Dr. Ralph Rossen, Hastings, Minnesota; Dr. George Kimmel, Red Wing; Dr. Nere Sundet, Kadoka, South Dakota; Dr. Floyd Thompson and Dr. Everett Perlman, both stationed at Pine Camp, Watertown, New York; and Dr. John Lohmann, Jasper, Minnesota.

* * *

The following medical reserve officers have been relieved from active duty with the United States Army:

Dr. Daniel Louis Fink, Minneapolis, first lieutenant, who was assigned to the Corps Area Service Command Station Hospital in Fort F. E. Warren, Wyoming.

Dr. Arnold Joseph Chlad, Saint Paul, first lieutenant, who was assigned to Fort Snelling.

Dr. Daniel James Moos, Minneapolis, first lieutenant, assigned to Fort Snelling.

Dr. Harlan Lamar Word, Saint Paul, first lieutenant, assigned to Fort Snelling.

Orders for the following medical reserve officers have been revoked:

Dr. John Ambrusko, Rochester, first lieutenant, who was assigned to the Basic Flying School (nonflying status), Taft, California.

Dr. Robert Dulaney Moreton, Rochester, first lieutenant, who was assigned to the Corps Area Service Command Station Hospital, Fort Leonard Wood, Missouri.

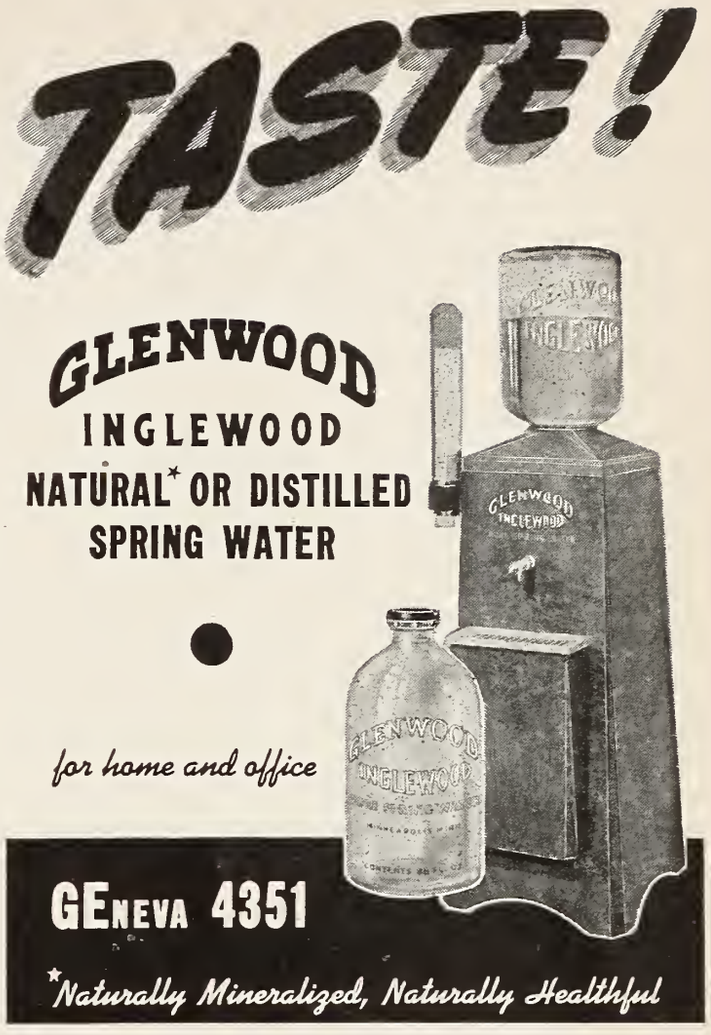
* * *

Medical reserve corps officers ordered to extended active duty with the United States Army include:

Irving Joseph Farsht, Minneapolis, captain, to Corps Area Service Command Station Hospital, Fort Bliss, Texas.

William Alfred Swedburg, Duluth, first lieutenant, to Corps Area Service Command Station Hospital, Fort Riley, Kansas.

Bruce M. Anderson, Rochester, first lieutenant, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Arkansas.



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Alister Ian Finlayson, Rochester, first lieutenant, Corps Area Service Command Induction Station, Fort Crook, Nebraska.
Forrest Ivan Rose, Saint Paul, first lieutenant, Corps Area Service Command Station Hospital, Camp J. T. Robinson, Arkansas.
William Hildebrand Wilson, Rochester, first lieutenant, Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyoming.
Norman Russell Beck, Rochester, first lieutenant.
William Vincent Leary, Rochester, first lieutenant.
Walter Russell Nickel, Rochester, first lieutenant.
Benjamin B. Wells, Rochester, first lieutenant.

* * *

This territory had a generous representation at the meeting of the Central Association of Obstetricians and Gynecologists held at New Orleans, October 2-4.

Among those attending were Dr. John H. Moore of Grand Forks; Dr. J. W. McGill of Superior; Drs. James R. Manley, Russell Moe and E. T. Martin of Duluth; Dr. and Mrs. J. C. Litzenberg, Dr. Harold Leland, Dr. Leonard A. Lang, Dr. T. W. Weum, Dr. John A. Haugen, Dr. Nora Winther, and Dr. Paul Larson of Minneapolis; Drs. Virgil Counseller, Lawrence M. Randall and Arthur Hunt of Rochester; Drs. Roger Countryman, E. C. Hartley and A. G. Schulze of Saint Paul; and Dr. D. E. Moorehead of Owatonna.

Dr. Litzenberg discussed a paper and also presented a radio lecture.

Papers by Minnesota men included, "Diaphragmatic Hernia in the Newborn," by Drs. John A. Haugen and Claude J. Ehrenberg of Minneapolis; and "Uterine Bleeding Due to Benign Lesions" by Drs. Lawrence M. Randall, S. B. Lovelady and Fletcher S. Sluder, Jr., of Rochester.

* * *

Taking part in the annual clinical program and meeting of the Minnesota Medical Alumni Association held in the University Hospitals, Minneapolis, October 31, the day before Homecoming were: Dr. Wesley W. Spink, Minneapolis, "Sulfonamide Therapy"; Dr. Lawrence R. Boies, Minneapolis, "Hearing Loss in Childhood"; Dr. Lloyd H. Ziegler, Wauwatosa, Wisconsin, "Reactions of Psychotic Individuals to Surgery"; Dr. Harry W. Christianson, Minneapolis, "Anorectal Diseases"; Dr. Miland E. Knapp, Minneapolis, "Physical Therapy of Fractures"; and Dr. Erling S. Platou, Minneapolis, "Human Serum Therapy."

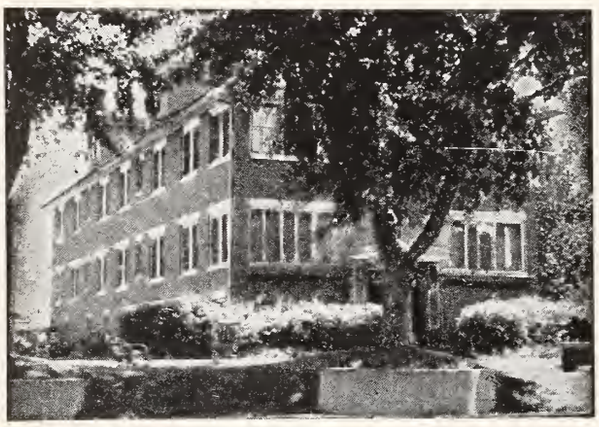
Dr. Wallace H. Cole of Saint Paul addressed the luncheon meeting in Coffman Memorial Union on the subject, "Recent Experiences in England."

The Class of 1921 celebrated its twentieth anniversary at this time.

The committee arranging the clinical program was composed of Drs. Horace G. Scott, chairman; Dr. Harold F. Buchstein and Dr. L. Haynes Fowler of Minneapolis, and Dr. John Richards Aurelius of Saint Paul.

* * *

Speakers at the forty-sixth annual meeting of the American Academy of Ophthalmology and Otolaryngology in Chicago, October 19-23, included Dr. Alfred W. Adson of Rochester, whose subject was "Surgical



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Dr. Adson and Dr. W. L. Benedict of Rochester also presented a motion picture, "Arteriovenous Fistula Between the Internal Carotid Artery and the Cavernous Sinus." Another motion picture, "Treatment of Traumatic Injuries of the Face," was presented by Drs. Gordon B. New and John B. Erich of Rochester.

Dr. Frank E. Burch of Saint Paul presented two motion pictures entitled, "A Muscle Recession Method," and "The Lundsgaard Iris Inclusion Technique and Bentzen's Method of Trephining for Glaucoma."

Dr. Hendrie W. Grant of Saint Paul was discusser of a paper, "Operative Results in Two Hundred and Eleven Cases of Convergent Strabismus," given by Drs. John H. Dunnington and Maynard Wheeler of New York.

Members of the Association's Board of Secretaries include Dr. Erling W. Hansen of Minneapolis, secretary for public relations, and Dr. Benedict, secretary for ophthalmology.

Dr. Fred J. Pratt of Minneapolis holds a life membership in the Association, while Dr. H. E. Binger of Saint Paul holds a senior membership.

The following 1941 candidates have been certified by boards: Drs. Arthur V. Garlock of Bemidji, Malcolm R. Johnson of Red Wing, Archie Olson of Duluth, Robert R. Tracht of Saint Paul.

BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

PROFESSIONAL ADJUSTMENTS. I. Gene Harrison, A.B., R.N. Educational Director, Druid City Hospital School of Nursing, Tuscaloosa, Alabama. 204 pages. Price, $2.25, cloth. St. Louis: C. V. Mosby Co., 1941.

WOUNDS AND FRACTURES. A Clinical Giude to Civil and Military Practice. H. Winnett Orr, M.D., F.A.C.S. Chief Surgeon, Nebraska Orthopedic Hospital, Fellow of the American College of Surgeons, Member International Society of Orthopedic Surgery, etc. 227 pages. Illus. Price, $5.00, cloth. Springfield, Ill.: Charles C. Thomas, 1941.

SHOCK TREATMENT IN PSYCHIATRY. A Manual. Lucie Jessner, M.D., Ph.D. Resident Psychiatrist, Baldpate, Georgetown, Mass.; Graduate Assistant in Psychiatry, Massachusetts General Hospital; Assistant in Psychiatry, Beth Israel Hospital, Boston; and V. Gerard Ryan, M.D., Associate Psychiatrist, Elmcrest Manor, Portland, Conn.; Assistant in Psychiatry, Harvard Medical School. Introduction by Harry C. Solomon, M.D., Clinical Professor of Psychiatry, Harvard Medical School, Chief of Therapeutic Research, Boston Psychopathic Hospital. 149 pages. Price, $3.50, cloth. New York: Grune & Stratton, 1941.

IMMUNITY AGAINST ANIMAL PARASITES. James T. Culbertson, Assistant Professor of Bacteriology, College of Physicians and Surgeons, Columbia University. 274 pages. Price, $3.50, cloth. New York: Columbia University Press, 1941.

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SYNOPSIS OF THE PREPARATION AND AFTERCARE OF SURGICAL PATIENTS. Hugh C. Ilgenfritz, A.B., M.D. Instructor in Surgery, Louisiana State University School of Medicine; Visiting Surgeon, Charity Hospital of Louisiana at New Orleans; and Rawley M. Penick, Jr., Ph.B., M.D., F.A.C.S. Professor of Clinical Surgery, Louisiana State University School of Medicine; Visiting Surgeon, Charity Hospital of Louisiana at New Orleans. Foreword by Urban Maes, M.D., D.Sc., F.A.C.S. Professor of Surgery and Director of the Department, Louisiana State University School of Medicine; Senior Visiting Surgeon, Charity Hospital of Louisiana at New Orleans; Consulting Surgeon, Touro Infirmary. 532 pages. Illus. Price, $5.00, flexible binding. St. Louis: C. V. Mosby Co., 1941.

THE ART AND SCIENCE OF NUTRITION. A Textbook on the Theory and Application of Nutrition. Estelle E. Hawley, Ph.D., and Grace Carden, B.S. University of Rochester, School of Medicine and Dentistry, Rochester, N. Y. 619 pages. Illus. Price, $3.50, cloth. St. Louis: C. V. Mosby Co., 1941.

THE MASK OF SANITY: AN ATTEMPT TO REINTERPRET THE SO-CALLED PSYCHOPATHIC PERSONALITY. By Hervey Cleckley, B.S., B.A., M.D., Professor of Neuropsychiatry, University of Georgia School of Medicine, Augusta. Cloth. Price $3. Pp. 298. St. Louis: C. V. Mosby Company, 1941.

This is an interesting monograph dealing with those individuals whose deviations of personality and behavior abnormalities have long perplexed the psychiatric world, and still remain puzzling problems. The author reviews the subject in a general way, and then sets forth his own ideas and conclusions, pointing out that there are large numbers of persons in every community belonging to this group who are irresponsible and consistently fail to carry out any normal pattern of life. These failures result in disasters to themselves and misery and despair, persistently, to their families. There is great need for a better understanding of these serious personality derangements, in order that they may be frankly recognized, and in order that medical efforts to treat and protect them, may progress.

Cleckley believes that this group is especially difficult to deal with because, unlike all the other serious personality disturbances, a mask of perfect sanity conceals the real inward state of all persons disordered in this manner. This mask deceives the community, the law courts, and, all too frequently, even the physicians who try to understand and help them. Existing opinions regarding this group are summarized. It is carefully differentiated from other entities, and the clinical syndrome is clearly outlined. Fifteen case histories are presented. An attempt is made to interpret the clinical process and therapy is discussed. There are places in this book in which it is felt that the author pays too much attention to the literary style, rather than the actual subject matter at hand, but in general it is a worthwhile contribution. It is recommended to those interested in psychiatry and personality studies.

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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society

Volume 24 December, 1941 No. 12

WHAT SHOULD BE DONE WITH ACUTE CHOLECYSTITIS?*

RAYMOND W. MCNEALY, M.D.

Chief Surgeon Wesley Memorial Hospital
Attending Surgeon Cook County Hospital
Chicago, Illinois

THE thesis for our discussion poses a question of, "What should be done for patients with acute cholecystitis?" This problem has given rise to so many heated discussions and such widely differing conclusions have been reached, that perhaps it would be well to try to define what we mean by the term "acute cholecystitis" before we attempt to answer the question.

Definition

It is necessary to realize that the term "acute cholecystitis" is a label applied to a disease process which varies with each patient and constantly changes in the same individual. The pathologic changes and the associated physiologic dysfunctions are invariably kinetic and never static. Such an approach to our problem carries the implication that few invariant rules can be laid down for the proper course to be followed in the treatment of each individual disease process. The time is probably very remote when fixed rules of procedure will supplant the surgical judgment of the experienced clinical surgeon.

Purpose of Reviewing 500 Cases.—It would seem that an analytical review of a large number of cases of this disease should yield some useful suggestions in determining the proper management of individual cases. Therefore, my coworkers and I have made a study of 500 cases of "acute cholecystitis" admitted to the Cook County Hospital in 1939, 1940 and the first four months of 1941. In the selection of these cases we used not only those which were admitted in an acute attack, but also included fifty-five patients who gave a history of having had previous acute attacks, although on admission the condition was not acutely active. If we agree that gallbladder disease is a changing dynamic process, either growing progressively worse or temporarily receding, we should have as much concern with those patients who have experienced and recovered from previous acute attacks as we have with those admitted to the hospital while suffering from such an episode.

As we have considered it, then, acute cholecystitis is a descriptive term given to varying degrees of acute inflammation of the gall bladder. The inflammatory changes found in our patients revealed many histological alterations which were obviously recent. Yet almost uniformly these were superimposed on chronic changes in the gall bladder, its closely related biliary tract, and the liver.

Pathogenesis

Attention has been called repeatedly to the paradoxical fact that so few pathogenic bacteria are found in the walls or contents of acutely inflamed gall bladders. The frequency of sterile inflammation and the degree to which it may progress without becoming secondarily infected are moot questions. Nevertheless, this chemical inflammation can be almost as devastating as a bacterially initiated one.

On examination of the surgical and pathologic reports in our series we found that slightly more than 80 per cent of the patients operated upon exhibited gallstones. A somewhat higher incidence is reported in most statistical studies. Foss and Lillie[6] and Berk[1] report 92 per cent; Walters[11] gives a figure of 89 per cent. In 8 per

*Read before the Duluth Surgical Society, Duluth, Minnesota, May 23, 1941.

TABLE I. CORRELATION BETWEEN PATHOLOGIC CONDITION FOUND AT OPERATION AND TEMPERATURE, PULSE RATE AND WBC.

Operative pathologic condition	Temperature above 100	Pulse rate above 100	WBC above 10,000
Perforation	76%	50. %	86. %
Gangrene	57%	33. %	85.7%
Empyema	66%	23. %	73.3%
Acute suppurative	50%	42.8%	57. %
Acute	50%	34.7%	61. %

cent of the operative cases in our series there was no report as to whether or not stones were present in the gall bladder.

In those cases with calculi one is impressed with the frequent occurrence of a mechanical obstruction due to the impaction of a stone in the neck of the gall bladder or in the cystic duct. Here we find a mechanism which quite regularly initiates a chain of destructive processes. In any hollow viscus, obstruction plus secretion leads to a luminal distention, which continues until the secretory pressure of the lining cells is reached or exceeded. When this level is attained, it is at or near the level of the arteriolar and capillary pressure of the vessels which maintain the vitality of the walls of the obstructed viscus. In some instances areas of focal necrosis develop, and these may extend and coalesce until the walls are widely devitalized. Even before frank rupture occurs, these walls become as permeable as an inert membrane, so that chemicals, toxins and even bacteria may filter through them in either direction. In some instances this permeability of the devitalized gall-bladder wall permits bile to filter out into the free peritoneal cavity, where it may set up a local or diffuse peritonitis. In our study there were fourteen cases in which free fluid was found in the peritoneal cavity, although there was no evidence of perforation of the gall bladder.

Symptoms

In the recent literature on acute cholecystitis we find some authors stating what combination of symptoms and laboratory findings can be relied upon as an indication of the necessity for surgical intervention. A leukocytosis, a rising temperature and an increasing pulse rate have been particularly emphasized.[5] On the other hand, many investigators state that the clinical picture is a very inadequate guide to the pathologic changes which may be found at operation.[1,2,7]

We have found that the onset of the attack is not usually accompanied by an appreciable rise in temperature or a marked leukocytosis, so that the condition may become very serious before these objective symptoms appear. This situation may be summarized as follows:

	Percentage of total (500)	Percentage showing symptoms within 24 hours
WBC above 10,000	49.2 (246)	17. (41)
Temperature above 100	23. (116)	21. (24)
Pulse above 100	20. (100)	22. (22)

The correlation which we found to exist between the pathologic condition seen at operation and the temperature, pulse rate and white cell count is shown in Table I.

In the case of perforation, gangrene, and empyema we found the correlation with the temperature and leukocyte count to be fairly constant; but from the figures we obtained it would not appear that these signs can be too implicitly relied upon.

Pain at some time during an attack seemed to be an almost universal symptom; 99.6 per cent of the patients we studied had severe pain with their attacks. Forty per cent of these had a colicky type of pain. Only one patient, who incidentally was found at operation to have an empyema of the gall bladder, gave a history of no pain. One other patient was moribund when admitted and no history was obtained before he expired. At autopsy he was found to have a perforated gall bladder with a diffuse peritonitis. Tenderness in the right upper quadrant was almost as invariable a symptom as pain; 95.2 per cent presented this condition. Ninety-one and eight-tenths per cent of the 500 patients had nausea, and 86 per cent vomited with their attacks. Thirty-eight and four-tenths per cent of the patients in our series were either jaundiced on admission or gave a history of having previously been jaundiced. Eighty-three per cent of the patients operated upon and who were jaundiced had stones. All of the patients who exhibited calculi in the common duct were jaundiced on admission. In 38.8 per cent of the cases a

rigidity of the upper abdomen, ranging from slight to severe, was found, and in 29.6 per cent a mass was palpable in the region of the gall bladder. The correlation between these two physical findings and the pathologic condition revealed at operation is shown in Table II.

When a patient presents a combined picture of rising temperature, an increasing leukocytosis, marked muscular rigidity and tenderness, an extremely grave situation, of course, is suspected.

TABLE II. CORRELATION BETWEEN PATHOLOGIC CONDITION AT OPERATION AND THE PRESENCE OF RIGIDITY AND MASS IN THE RIGHT UPPER QUADRANT OF THE ABDOMEN

Operative pathologic condition	Rigidity	Mass
Empyema	30. %	65. %
Perforation and gangrene	51.8%	37. %
Acute and subacute	61.2%	58. %
Acute suppurative	30. %	30. %
Hydrops	33. %	83.3%
Common duct stone	25. %	18.7%
Phlegmon	0	50. %
Chronic	30. %	25. %

Dangers of Perforation

It has too often been assumed that perforation of the gall bladder is so rare an occurrence as to be a negligible consideration. However, recent statistical studies have shown that the possibility of a rupture of the gall bladder is not to be dismissed lightly. Edwards, et al.,[3] who recently reviewed 194 cases of acute cholecystitis proven either by operation or autopsy, showed that perforation of the gall bladder into the peritoneal cavity occurred in twenty-one patients, a percentage of 10.82, with a mortality of 28.59 per cent in those who perforated. Eiss[4] gives figures on 574 cases, in 9.2 per cent of which perforation occurred, with a 35 per cent mortality in the patients who perforated. Heuer[7] has combined figures from 35,000 cases in which there was a 20 per cent incidence of perforation with a 10 per cent mortality. In our series, fourteen of the 216 operated cases (6.9 per cent) were found to have an acute perforation of the gall bladder, and six of these died (42.8 per cent). Two patients who died without operation were also found at autopsy to have a perforation. Thus, in a total of sixteen acute perforations there was a 50 per cent mortality.

Such a dangerous possibility must always be kept in mind when considering the management of an acute cholecystitis. The problem in cases where impending or actual perforation is suspected is that of deciding on the extent of immediate operative interference and of giving the patient careful pre-operative and postoperative care. With this statement very few could take exception.

In view of such dangers, it might be asked, when are we, if ever, justified in delaying operation in acute gall-bladder attacks?

When to Operate?

Radical versus Conservative Treatment.—Surgical opinion on the management of acute cholecystitis today seems to be divided into two schools of thought. The so-called radical group plead for early operation in every case. Many of them suggest that acute cholecystitis is analogous to acute appendicitis. On the other hand there are many distinguished surgeons who are inclined to a more conservative view, and suggest that watchful expectancy in some cases of acute inflammation of the gall bladder is not only advisable, but is followed by better results than would occur if the rule of early operation in all cases were invoked. These advocates of conservative management point out glaring contradictions in the assumption that acute gall-bladder disease is analogous to an acute inflammation of the appendix. The arguments pro and con cannot be given in this paper. Approaching our problem with the recognition of the dynamic process character of the disease, we find that the solution is difficult because of our inability to correctly predict the outcome of a condition affording us such meager dependable data for conclusions.

It has been generally agreed that the safest time for emergency operation is within the first twelve to twenty-four hours of the attack. In order to accomplish this, a surgeon would need to serve only the most highly intelligent and thoroughly coöperative patients. The situation that actually exists in most surgical practices and services is not conducive to surgical intervention in the first few hours of acute attacks. In the majority of patients, biliary colics or postprandial distresses of varying degrees of severity are

common episodes. Seventy-five per cent of those in our study had had previous attacks for an average period of three years. Such patients had been experiencing attacks ranging from slight postprandial discomfort to severe, disabling seizures. If the patient or the attending physician could only know when the first symptoms were going to culminate in a violent attack with serious involvement of the biliary tract, such clairvoyance would undoubtedly lead the patient to submit himself to the earliest possible surgical intervention. If he has weathered one or more such episodes before, however, he will be inclined to hope to do so again. Therefore, it is usually only after the patient is thoroughly convinced that the attack is not going to recede that he seeks advice. The delay may allow the disease process to advance to a critical stage before the surgeon is consulted.

In our series 23 per cent came to the hospital within the first twenty-four hours of the onset of acute symptoms, and this figure probably is somewhat higher than would be found in a noncharity hospital.

There may be instances of acute inflammation of the gall bladder occurring in very young persons in whom neither history nor associated findings suggest a previous disease of the biliary tract, but this may be regarded as the exception rather than the rule. In our study there were only 70 patients under thirty years of age. Of this group, only fifteen were admitted when having their first attack of gall-bladder disease. The remainder had been having attacks for an average of 1.3 years.

Such a situation as we have just discussed, in itself offers almost insuperable obstacles to the laying down of any rigid rules of conduct for either patient or surgeon.

It is undoubtedly true that the acute attack does subside in many instances. Of the 500 cases reviewed, 216 (43.1 per cent) received operation, and 284 (56.9 per cent) were treated medically. Of these 284, 6.3 per cent refused operation, although it was recommended; and six others (2.1 per cent) went home on release, though unimproved. In other words, in about one-half of these cases the process did subside temporarily under a medical regime. In such instances, however, the symptoms and signs usually abated within a short time after the onset. In the cases we studied the average hospital stay of the nonoperative patients was nine days, while there was an average delay of twenty days before operation in the 216 operative cases.

It can scarcely be doubted that the most desirable time for gall-bladder surgery would be at a period when all acute symptoms have subsided. Among the fifty-five patients (25.4 per cent) in this study who had such "elective" operations, there were no deaths. The difficulties of the operation are greatly reduced. Cholecystectomy can be done more regularly, and the operation of cholecystostomy (which must so frequently be followed later by a cholecystectomy) does not have to be resorted to. Our records show that those patients who are "cooling off" have an almost fifty-fifty chance of reaching a satisfactory quiescent state. This would offer some encouragement to those who recommend the conservative treatment in many acute gall-bladder conditions.

The problem that every surgeon faces, however, when confronted by an acute upper abdominal pain in a case where the gall-bladder is under suspicion, is the decision as to whether this is a time when the disease will subside with medical treatment, or whether surgical intervention is imperative.

While we cannot presume to give a sharp answer to this problem, certain important factors emerge from our review which may be of some assistance in determining the wisest course to follow.

Duration of Illness.—The duration of the patient's illness must, of course, be taken into consideration.

Many investigators have attempted to determine the optimum time for operation after the onset of an acute attack. Table III sums up the relationship in our series between the mortality rate and the delay from onset of recent acute symptoms to operation.

In a large series of operative cases (3,986), Heyd[8] has given figures to show that the safest time for emergency operation is within six to twenty-four hours after onset of the acute attack. In the group we have studied only three were operated upon within twenty-four hours of the onset of symptoms and none of them died. There was only one death among those operated upon within three days of the beginning of the attack. After three days the mortality rate rises rather sharply.

TABLE III. RELATIONSHIP BETWEEN MORTALITY RATE AND DELAY FROM ONSET OF ATTACK TO SURGERY.*

Delay from onset of attack to surgery	No.	Per cent	Deaths	
			No.	Per cent
Less than 1 day	3	1.8	0	0
1 to 3 days	18	11.2	1	5.5
4 to 7 days	20	12.5	4	20.
8 to 14 days	28	17.5	5	17.8
15 to 21 days	28	17.5	3	10.7
22 to 30 days	28	17.5	8	28.5
1 to 2 months	31	19.3	5	16.1
Over 2 months	4	2.5	2	50.

*Of the 216 operated patients, 161 were admitted in acute attack. In one instance of these 161 cases the time of onset was not given. Fifty-five were not in acute attack on admission, but had had one or more previously. In this group there were no deaths.

In the group of operative patients who died there was an average delay of twenty-four days from the onset of symptoms until surgery. In the operative patients who survived (excluding the 55 elective operations), there was an average delay of eleven and one-half days from the onset of symptoms to operation. This is not very conclusive, however, because the longer delay was given in the hope that the patient would be better able to withstand an operation. The shorter delay speaks for more tractable cases.

Importance of Age of Patient.—A factor which must be considered in combination with the duration of the patient's illness is his age. Some reports have stressed the severity of gall-bladder disease in younger patients, but our figures show a higher mortality rate among older individuals, which rises proportionately with age. Table IV gives the relationship between the age groups and the mortality rate.

Chronic disease processes in the liver, kidneys and lungs are less likely to be present in the young patient. The duration of symptoms referable to the gall bladder in the younger group of patients in our series was 1.3 years, while in the older group the average duration of symptoms was 3.8 years. In the younger individual there is usually a greater assurance of a sufficient liver function reserve to carry him through an acute gall-bladder attack and the emergency operation.

TABLE IV. RELATIONSHIP BETWEEN AGE OF PATIENT AND MORTALITY RATE, TOTAL GROUP AND OPERATED PATIENTS.

Age of patient	Total group (500)			Operative group (216)		
	No.	%	Mortality %	No.	%	Mortality %
Under 30	70	14.	1.42	23	10.7	4.3
30 to 50	266	53.2	6.7	118	54.6	11.01
Over 50	165	32.8	12.1	75	34.7	18.6

The occurrence of an acute attack in the person of middle age and above, however, does not offer as definite an indication for emergency surgery. The patients in these age groups are prone to have chronic degenerative diseases of the liver, pancreas, kidneys, heart and lungs, and the pathologic process in the gall bladder is more likely to have concomitant disease processes in the liver and the biliary tract. In thirty operative cases there was definite mention of a diseased liver and in thirteen instances a diseased pancreas was noted; twelve of these forty-three individuals died (27.9 per cent). The average age of these patients was fifty years and they had been having previous attacks for an average of three and one-half years. Just as treacherous is the presence of stones in the common bile duct. In our study such a condition was found in sixteen operative patients and seven of these died (43.7 per cent). All of them had been having gall-bladder attacks for two or more years. The average age of these patients was forty-five years.

In such cases, before indulging in hasty surgical intervention, a very careful evaluation of the risk must be made, followed by a thorough preoperative preparation. If the patient is having an acute attack, one cannot and should not indulge in a series of tests and studies that have not been shown to be fairly dependable, nor should operation be delayed longer than needed for adequate preparation.

Regimen for Management

It would be well for every surgeon and every hospital to outline a thoroughly thought out regime for the management of acute cholecystitis cases. Adherence to such a regime should make for more efficient and accurate evaluation of each individual case and unnecessary delay may

be eliminated in those cases where emergency operation is felt to be imperative. Adequate preoperative and postoperative care can do much both to reduce the mortality rate and the incidence of debilitating complications.

In my own service we are inclined to proceed along fairly standard lines. As soon as the patient is admitted, we carry out the usual blood and urine examinations. If the patient is vomiting, we immediately pass a Levine tube and begin continuous suction. Glucose is administered intravenously in 5 per cent solution in water at

TABLE V. TYPES OF OPERATIONS EMPLOYED IN RELATION TO DELAY BETWEEN ADMISSION AND OPERATION AND IN RELATION TO MORTALITY

Immediate operation*			Delayed operation**			Totals	
	No.	%		No.	%	No.	%
Total patients this group	25	11.5	Total patients this group	191	87.9	216	100
Cholecystostomy	22	88.	Cholecystostomy	29	15.1	51	23.6
Deaths	4	18.1	Deaths	8	27.5	12	23.5
Cholecystectomy	1	4.	Cholecystectomy†‡	137	71.7	138	63.8
No deaths			Deaths	7	5.1	7	5.07
Exploration only	2	8.	Cholecystectomy and exploration or drainage common duct	22	11.5	22	10.
Deaths	1	50.	Deaths	7	31.8	7	31.8
			Explore only	2	1.04	4	1.8
			Deaths	1	50.	2	50.
			Drained abscess only	1	.52	1	.45
			No deaths				
Total mortality this group	5	20.	Total mortality this group	23	12.		

* Twenty-four hours or less from admission to surgery.
**Average delay (191 cases) of twenty days.
†Includes two partial cholecystectomies.
‡Includes forty-three cases in which appendectomy was also done. No deaths in this group.

TABLE VI. RELATIONSHIP BETWEEN OPERATIVE PATHOLOGIC CONDITIONS AND DURATION OF ILLNESS

Delay from onset of attack to surgery	Conditions found at operation						
	Pericholecystic abscess	Common duct stone	Perforation and gangrene	Acute and subacute cholecystitis	Acute suppurative cholecystitis	Phlegmon	Empyema
Less than 1 day			3		2		
1 to 5 days	2		9	5	2		5
5 days to 1 week			3		2		7
1 week to 3 weeks	1	2	6	19	3	1	7
Over 3 weeks	4	14	6	7	1	1	1
Totals	7*	16	27†	31	10	2	20
Mortality percentage	57.1	43.7	25.9	6.4	20.	100	30.

*Includes three cases of perforation with pericholecystic abscess formation; all three died.
†Includes four cases of chronic perforation.

the rate of about 500 c.c. per hour. Advantage is taken of this administration of glucose solution to make some estimate of the liver's functional capacity by testing the urine for sugar spill after each 500 c.c. flask. If the patient is a questionable risk, blood transfusion may be used. In every acute case donors are typed and matched. Intravenous administration of Vitamin C in the glucose or in salt solution is a routine procedure. The jaundiced patient presents a problem requiring special care. In the cases we studied, 56 per cent of those who died were jaundiced on admission to the hospital. I have elsewhere discussed the preparation of the jaundiced patient for surgery.[9]

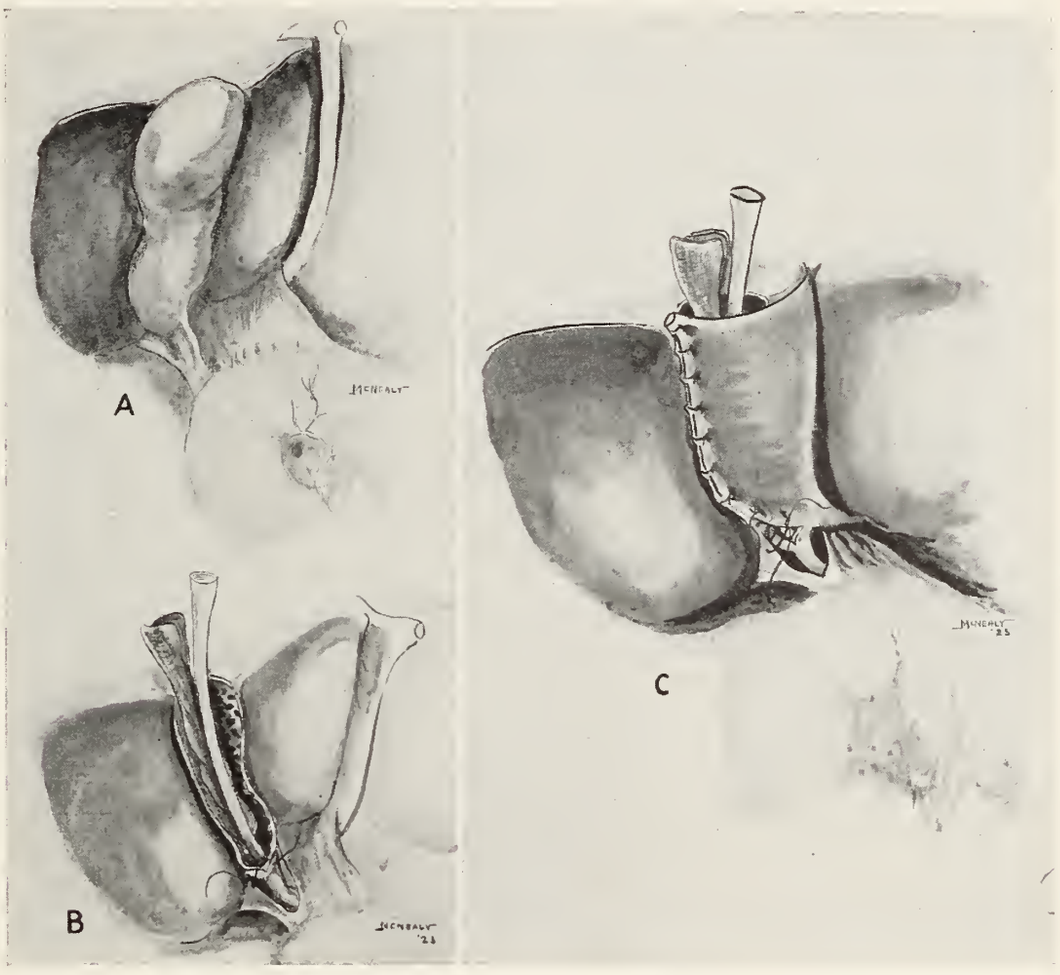


Fig. 1. Illustrating a technique for a partial cholecystectomy. *a.* Shrunken deformed gall bladder. *b.* The portion of the gall bladder which is firmly attached to the liver is not disturbed. The walls are trimmed off down to the cystic duct, into which a catheter is inserted down through to the common bile duct. A small iodoform gauze wick is brought out with the catheter. *c.* Showing falciform ligament attached to the lateral margin of gall-bladder edge. The wick and catheter are best delivered through a stab wound in the right subcostal area.

Operative Procedures

It is interesting to note that in the twenty-five operations done within twenty-four hours after admission to the hospital a cholecystostomy was employed in 88 per cent (22) of the cases. In the 191 operations which were delayed (for an average of twenty days), a cholecystectomy was employed in 83.2 per cent of the cases. Table V shows the types of operation employed in relation to delay between admission and operation and in relation to the mortality rate. The results in this table should be compared with those given in Table III where the relationship between mortality and the delay from the onset of the attack to operation is shown. No conclusions can be drawn as to the relative merits of cholecystostomy and cholecystectomy, because the former was almost always used in very serious cases. For example, cholecystostomy was done in twenty cases of perforation and gangrene, in ten cases of acute suppurative cholecystitis and in seventeen cases of empyema.

Partial cholecystectomies were used in only two instances in this series, but I have found

TABLE VII. RELATIONSHIP BETWEEN PATHOLOGIC REPORTS AND MORTALITY

Pathologic report	No.	Per cent	No. died
Chronic cholecystitis	16	11.	2
Chronic cholecystitis and cholelithiasis	97	66.8	5
Acute cholecystitis	7	4.8	1
Cholesteatosis	9	6.2	0
Chronic ulcerative cholecystitis	10	6.8	2
Hemorrhagic cholecystitis	6	4.1	1

TABLE VIII. PATHOLOGIC CONDITION OF OPERATIVE AND NON-OPERATIVE DEATHS

Operative		Non-operative	
Common duct stone	7	Perforation	2
Perforation	6	Empyema	1
Empyema	5	Diabetes	2
Acute suppurative	2	Hypertension and heart disease	2
Acute inflammation	2	Not known (no autopsy)	2
Phlegmon	2		
Hemorrhage*	2		
Gangrene	1		
Chronic†	1		

*Due to accidents in cases of anomalous vessels.
†Eviscerated postoperatively.

them of great value, especially where the gall bladder is very friable or necrotic in areas. This type of operation was recently described by Ritchie of Saint Paul.[10] I have practiced the method for nearly twenty years and can recommend it in selected cases (Figure 1, *a, b, c*).

In the elderly patient who presents a grave risk, we are inclined to use scopolamin and morphine as a preliminary narcosis and direct infiltration local anesthesia. A very easy and adequate exposure can be had in these cases through a subcostal incision about one inch below and parallel with the rib margin. This affords easy access to the fundus of the gall bladder for drainage, but should not be used, unless somewhat extended, for cholecystectomy.

In the postoperative care of these patients the value of glucose, sedation, oxygen and transfusion should be emphasized.

TABLE IX. RELATIONSHIP BETWEEN OPERATIVE COMPLICATIONS AND MORTALITY*

Complication	No.	Per cent	No. died	Per cent died
Pneumonia	18	8.3	12	66.6
Other pulmonary conditions	8	3.7	3	37.5
Peritonitis	12	5.5	9	75.
Wound infection	25	11.5	4	16.
Evisceration	3	1.3	2	66.6
Abdominal wall abscess	2	.92	0	0
Cholangitis and jaundice	7	3.2	4	51.1
Biliary fistula	6	2.7	0	0
Fecal fistula	2	.92	1	50.
Subphrenic abscess	7	3.2	2	28.
Hemorrhage and shock	2	.92	2	100.
Ileus	1	.45	1	100.
Toxic hepatitis and liver shock	3	1.3	2	66.6
Parotitis	3	1.3	0	0
Miscellaneous	6	2.7	3	50

*Many patients had multiple complications.

Pathology

Pathologic Condition at Operation.—The more serious conditions found at operation are given in Table VI, correlated with the duration of illness.

It is interesting to note in this table that perforation and gangrene were found in 44.4 per cent of those patients operated within five days of onset of symptoms.

Pathologic Reports.—There was little correspondence between the condition found at operation and the report of the tissue examined by the pathologist. Such reports were available in only 145 of the 216 operative cases. This is partly accounted for by the fact that there was an unusually high percentage of cholecystostomies in this series. Table VII presents the figures on such reports correlated with the number of deaths in each category.

Mortality

There was a mortality rate in these 500 cases of 7.8 per cent (thirty-nine deaths). Twenty-

eight of the 216 operated patients died, an operative mortality of 12.9 per cent. The pathologic condition in the operative deaths and the conditions found at autopsy or believed to be the contributing factors in the non-operative deaths are given in Table VIII.

Complications

Table IX presents the incidence of operative complications and the mortality entailed with each.

Summary

The term "acute cholecystitis" is a rather indefinite clinical expression which has been used with a wide variation of implications by authors on this subject. The dynamic process character of the disease makes it impossible to lay down precise rules for "when to operate." In considering this problem, the duration of the illness and the age of the patient must especially be taken into account. If operation can be done within twenty-four hours of onset of the attack, or if it can be safely delayed until the acute attack has subsided, these would seem to be the optimum times for surgery. However, since the majority of patients have previously weathered acute attacks, and consequently expect to continue to do so, they rarely present themselves for treatment in the first hours after onset of symptoms. Therefore, it is seldom possible to operate very early in the attack. There are also many cases where it would seem to be extremely hazardous to wait for the acute process to subside. In patients past middle life greater care must be exercised in evaluating the surgical risk and in giving them the advantage of adequate preoperative and postoperative management. A partial cholecystectomy is a valuable procedure in certain cases where the gall bladder is friable and extremely difficult to dissect from the liver bed. Cholecystostomy may be the operation of choice, especially in those older patients who present poor risks. The adoption of a rather standard regimen by hospitals and surgeons for the management of acute cholecystitis may reduce the incidence of complications and improve the mortality rate.

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REPORT OF THE STATE CHAIRMAN COMMITTEE ON MEDICAL PREPAREDNESS OF THE AMERICAN MEDICAL ASSOCIATION*

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THE Committee on Medical Preparedness was created by the Board of Trustees by authorization of the House of Delegates at the 1940 session of the American Medical Association in New York City. The committee comprises ten members of the House of Delegates and, ex officio, the president and secretary of the Association, the chairman and secretary of the Board of Trustees and the editor of the Journal. The committee is to coöperate with the advisory Commission on National Defense, the Army and Navy Medical Corps, the United States Public Health Service and all other Federal agencies in preparing our nation to meet any medical emergency.

Each state was provided with a chairman whose functions were (1) to coördinate the activities of state, county and district medical societies; (2) to coöperate with county medical societies in securing completion and return of the questionnaires on personal information; (3) to establish mechanisms for securing supplemen-

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

tary information to the questionnaire if necessary; (4) to organize a state committee on medical preparedness, to be composed of the president and secretary of the state medical association, the state chairman of the Committee on Medical Preparedness and, ex officio, the members of the Committee on Medical Preparedness of the American Medical Association from the Corps Area in which the state is located and any others the group may select; (5) to assist in the organization of county committees on medical preparedness; (6) to invite local and state health authorities to participate in the work of the program, particularly in the matter of civilian health; (7) to arrange for the dissemination of information on medical preparedness to the groups concerned with any particular matter; (8) to assist in the verification of the qualifications of physicians desired for service in the army, in industry or in special physical examinations and other special work necessary for national defense and (9) to report to the Committee on Medical Preparedness of the American Medical Association the names of physicians from each county of the state whose services are believed to be necessary for the maintenance of civilian health and who should, in the opinion of the state committee, be exempt from military service.

Of the schedules sent to the 3,517 licensed physicians in Minnesota, 97 per cent were returned. Letters to the remaining 3 per cent requesting the filling out and mailing of the schedules have been sent this week. Of the licensed physicians, 2,600 are members of the state medical association.

For the most part, the work in Minnesota has been handled through the office of the secretary of the State Association. The councilors and county officers have been most coöperative in furthering completion of the canvass.

The selective service regulations called for physicians in the specialties of surgery, medicine, orthopedics, ophthalmology, otolaryngology, pathology and neuropsychiatry to serve at the induction center at Fort Snelling in order to perform final examinations of inductees for one year's training in the army. The pool was formed by solicitation and voluntary acceptance of physicians from Minneapolis, St. Paul, Rochester, Willmar, St. Peter, Cambridge and Moose Lake to serve when called by the medical officer at the induction center. Remuneration was at the rate of fifteen dollars per day. Up to May 28, 12,000 inductees had been examined; 11.6 per cent of these were rejected.

Another important function of the state committee is to create a pool of physicians for replacements in communities left without physicians by reason of entering army service.

The council passed a resolution which authorized county chairmen to take census of requirements in their respective communities. Recent communications from the secretary of the American Medical Association urges that the names, or at least the number, of physicians above and below the age of fifty-five years be tabulated so as to provide a working basis for evaluating the needs throughout the nation.

Communities without physicians will have to be supplied from near by centers by local physicians and an adjustment of fees that will be equitable to the physician for services rendered is a problem which to the patient in compensating for the service will require the attention of the county societies.

According to Mr. Davenport, in the issue of *Collier's* for May 10, 1941, the Selective Service system, under the direction of Mr. Clarence A. Dykstra and Brigadier General Lewis B. Hershey, has inducted 150,000 selectees per month into the army.

Although there was a variance of opinion among the neuropsychiatrists who examined these men, they were all of one accord that instead of 2 per cent of the inductees being rejected for mental disorders, the true percentage would be nearer 15 per cent. During the training period of the American Expeditionary Force in 1917-1918, 50 per cent of all casualties for which men were discharged were neuropsychiatric. At that time, no sincere effort was made to keep the mentally unfit out of the army. About 70,000 men, however, were rejected soon after reaching camp. In July, 1918, General Pershing cabled the Chief of General Staff in Washington the importance of eliminating the mentally unfit from replacement troops.

The selective service neuropsychiatric group under the able leadership of Dr. Sullivan has calculated, from correlated study and experience, that of the casualties, exclusive of fatalities occurring in the first eighteen months of service, 40 per cent will be neuropsychiatric cases. At

present, 14,232 more beds are being provided by the Veterans Administration; 5,268 of these will be for neuropsychiatric patients. It is estimated that for every neuropsychiatric patient, the Government pays $30,000.

Owing to the lack of qualified psychiatrists, and in the effort to eliminate the mentally deficient, it will be necessary to regulate the induction to make it possible for the induction teams to work harmoniously and avoid bottle necks. The army induction work sheet, especially the neuropsychiatric portion, has proved inadequate for the purpose for which it was intended.

It was with this in view that a work sheet was requested by the first of the year before inductions became heavy. Dr. J. A. Aita, Fellow in Neurology in the Mayo Foundation who had served on the Induction Board, consented to build up a neuropsychiatric work sheet which would cover the salient minimal data which could be carried out on an average of six minutes per inductee. At the induction center at Fort Snelling, we were fortunate in having neuropsychiatrists of Minneapolis, St. Paul and those from state institutions and the Mayo Foundation in attendance. In a recent study of 2,612 inductees, forty-nine, or about 2 per cent, were disqualified because of neuropsychiatric disorders.

The value of these examinations cannot be estimated accurately, but an approximation can be determined to justify the procedure. When a few weeks to a few years will have lapsed, figures will be available to make definite classifications for guidance in future mobilization.

Hypertension among the inductees has been in considerable evidence. The ordinary methods prescribed in regulations are not wholly adequate, in that borderline cases, which may be considered functional, are beginning types of true essential hypertension. In such cases, more detailed study by use of the cold pressor test and ophthalmic examination of the fundi as aids to the evaluation of the patient should be carried out. The standard blood pressure readings of 150 mm. of mercury systolic and 90 diastolic as set by the selective service regulation may exclude certain men who normally have a higher range of blood pressure. On the other hand, patients whose blood pressure during rest is within the normal range but who are really in the hypertensive group will be accepted. The more detailed examination, just mentioned, which is not time consuming, would prove worth while if the government costs in after years are considered.

Recent rulings by the Selective Service Board concerning deferments of medical students until after completion of internships are welcome. Much credit is due to the Deans of the Medical Schools for emphasizing the necessity of such a ruling, as otherwise depletion of the annual supply of physicians to the army certainly would occur.

THE DOCTOR IN THE NEW ARMY*

COLONEL JOHN R. HALL, M.D., Medical Corps, U. S. Army
Director of the Hospital Subdivision of the Office of The Surgeon General
Washington, D. C.

I BRING you greetings from The Surgeon General of the Army. It is a pleasure for me to be called to this rostrum as a representative of my chief. It so happens that I am a native of a neighboring state. It has been my good fortune to spend many periods of summer training with the medical R.O.T.C. groups at nearby Fort Snelling. I feel that I am almost a native son.

I have spoken of "my chief," The Surgeon General of the Army of the United States. I should like each one of you to ask himself the question, "Who, or rather what, is The Surgeon General of the Army?" I should like you to think of The Surgeon General as the doctor, the family doctor, if you will—that member of the medical profession called by the President and by Congress to direct the medical affairs of that "large family," the Army of the United States. Just as the family doctor would search through, study, and advise concerning every phase of family life, so The Surgeon General and the members of his corps concern themselves with every phase of army life.

*Read at the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

Perhaps my subject, "The Doctor in the New Army," can best be presented if we set up for ourselves an outline of the duties, or rather the missions, of the Medical Department. They may be stated as follows:

FUNCTIONS OF THE MEDICAL DEPARTMENT

I. Selection of Personnel
   A. Physical examinations
   B. Adequate records
II. Preventive medicine
   A. Hygiene and sanitation
   B. Immunizations
III. Curative medicine
   A. Rescue and transportation
   B. Hospitalization
IV. Final separation from service
   A. Examinations
   B. Records

As we discuss these various activities of the Medical Department, I suggest that each listener project himself into the picture as a player on the team. Each should remember that his position on the team may not be the post of his selection, but he can rest assured that the function he is performing is important in winning the game—winning the game, the price of which may be the life of the nation and even freedom itself.

Need I recall to you the fact that until modern medicine was born, the profession never really sold itself to "a nation in arms." Until the doctor could weed out the physically unfit by physical examinations, until he could cure the sick and heal the wounded, his work in the Army was a mere gesture of mercy, unorganized and almost unrecognized. How often during my twenty-six years of service I have heard some vexed line officer exclaim, "Oh, these .... doctors! Such a bother!" The warmest welcome I have ever received was on the south bank of the Ourcq, in the Aisne-Marne counteroffensive. I had just reached the embattled 39th Infantry, which had been without ambulance service many hours. The colonel exclaimed, "Hello, Medico! How'n h—did you get here? I am glad to see you."

Ever since the beginning of history that feeling in the hearts of men which has impelled them to go to the relief of suffering humanity, and which has impelled some of them to become doctors, has led medical men to the battlefield. The place of the doctor in the armed forces has been fairly won and honorably maintained.

Vast changes have occurred in the last one hundred and fifty or two hundred years. The history of our own Revolution shows that medicine of that day had so little to offer that frequently the doctor, always a leader in his community, appeared upon the battlefield not in his professional rôle, but as the organizer and the leader of combat units. General Warren who fell that day at Bunker Hill was not a soldier, but was a leading doctor in the Massachusetts Colony. It was he who led the Minute Men. It was he who set the British columns flying from Concord and Lexington, bottling them up in Boston. In the combat at Bunker Hill Warren relinquished his command to those better trained in military affairs. He fought as a private. There is no doubt that before receiving his fatal wound that day, he attempted to succor those about him who were injured, but there was no organized effort at medical care.

Frederick the Great stated that General Washington was the most brilliant military leader in his generation. It is interesting to note what Washington had to say about military medical service. I quote: "Each regiment should have at least two good doctors, and there should be a hospital somewhere in the rear where the sick could be cared for." Apparently the possibility of an organized rescue, first aid, and transportation of the wounded to a place of safety during the combat had never occurred to him. It remained for Larry, Napoleon's great army surgeon, to conceive the idea of the "Flying Ambulance."

It remained for our own Jonathan Letterman to organize a complete medical service with first aid detachments, dressing stations, ambulances, hospitals, and a well-conceived system of supply—and to prove its efficiency in the battle of Chancellorsville. How disheartening it must have been for him in the Gettysburg campaign to have had his medical wagons turned back, first by General Hooker and again by General Meade—this for fear that the valuable material might fall into the hands of the Confederate Army—and finally to come to battle without dressings, tentage, blankets, medicines and food for the wounded. Even opiates and anesthetics were on the medical purveyor's wagons, a full day's march from the field—a full day, even had they been able to advance over roads which were clogged with other traffic.

Largely from the lessons to be gleaned from

this disrupted medical service in the Gettysburg campaign has come our present organization which fully recognizes the necessity of placing each echelon of medical service under the command of medical officers. Many doctors have said to me, "I see no necessity for placing a doctor in command of ambulances. It is wasting a trained man." Experience has demonstrated time and time again that only the trained medical man with an understanding of the needs of the medical men who minister to the wounded can be depended upon either to transport medical supplies to the front or to transport the wounded from the front to the hospitals. But more of this later. Let us return to Section One of our table.

I. Selection of Personnel

The importance of a searching physical examination cannot be overemphasized. It is necessary that we weed out the physically unfit; else the Army will find itself encumbered by individuals who cannot carry on, and at a later time the pension rolls will bear the names of countless numbers of persons to whom the taxpayer owes not one iota of moral responsibility. Sick rates in any newly mobilized army will be high, and if the physically unfit are not left at home, the medical service will be overrun and will not be able to function properly.

II. Preventive Medicine

The doctor in uniform, above everything else, must be a practitioner of preventive medicine. He is a "public health officer." It is his duty to keep his soldiers well. Any good doctor can be depended upon to handle his patients in a creditable way, to give excellent treatment. Relatively few, however, are so well equipped in the field of preventive medicine. Most are not qualified in matters pertaining, for instance, to water supply, to sewage and waste disposal, to the inspection and preparation of food stuffs, or to the handling of epidemics. For this most important work the average doctor has had no practical training, and, I fear, in many cases even no classroom training of the basic sort. His general training is excellent, his basic information is sound, and once he turns his mind and his energies to the task, his results are good.

May I point with pride to the medical records of the World War, when for the first time in the history of the United States an armistice day found us with battle deaths outnumbering deaths from illness? That it was not always thus in evidenced by the records. We are told that the Revolutionary soldier had about seven times as many chances of dying from disease as of being killed by a British bullet. The record is something like four or five to one in the Mexican War and certainly not better in the Civil War.

In the Spanish American War the record was so poor as to be a scandal. In this war for the first time in the history of the world large numbers of men were mobilized who were non-immune to many of the communicable diseases. The soldiers of that day who came from the cities left water-borne sewage systems, carefully selected water supplies; they left refrigeration and a better milk supply, food selection, and, above all, they left screening against the fly. Even the ruralists were in some measure protected by these sanitary practices. Once the men were in camp and shorn of these protections, devastating epidemics of food-borne, water-borne, fly-borne and mosquito-borne diseases occurred. But why dwell upon the dark page of morbidity and death?

Necessity is the mother of invention; and so the profession at large and particularly the Medical Department of the Army really went to work. Came shortly the work of Walter Reed and Gorgas on the mosquito, the work of Darnell in chlorination of water; then came vaccination against typhoid and a host of other protections, until preventive medicine can be said to be at least adolescent. Every city, every hamlet, almost every household is now, in some measure at least, happier, better, and healthier because of this great branch of medicine.

But to the field of military medicine this happy state of affairs has added a great task, a tremendous responsibility. Never before has this nation, or any other nation for that matter, in mobilizing its man power found such a group of young men who are non-immune to communicable disease. The danger of epidemic is greater than ever before in our history. Never has the profession met such a challenge! Yes, the doctor in uniform must above all things else practice preventive medicine. And I may add that when and if you are called to the colors, the Army will make no apologies to you for being very exacting in its demands of you in this field.

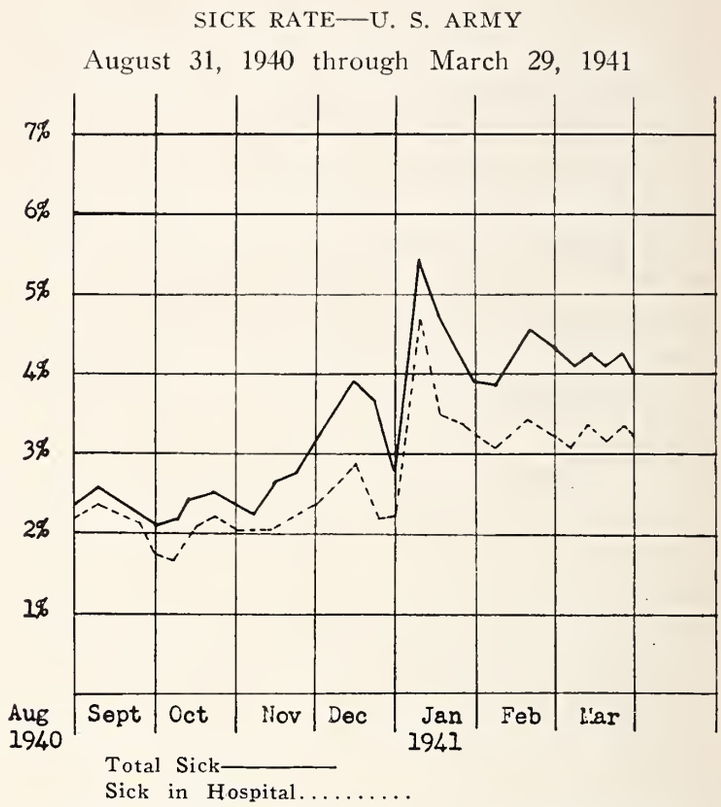
III. Curative Medicine

The doctor in civilian life when called to care for the sick or injured usually finds his patient in bed in a home or in a hospital. We have become so accustomed to the conveniences with which the sick are surrounded that we accept them as a matter of course, and as no concern or responsibility of the practitioner. In the home there is a well-planned kitchen, there are loved ones to act as nurses, the most needed articles for treatment are usually at hand, and the telephone at our elbow brings drugs, supplies and a nurse's help. Or let us suppose that our patient has suffered an acute illness or injury on the street or in the factory. A well-trained rescue squad, probably from the police department or from the city hospital, has come to him, has effected a rescue, has given first aid and has transported the sufferer to a well-equipped hospital. The doctor has only to familiarize himself with his patient's condition and begin his treatment. We give little thought to how these conveniences have been provided.

Not so in the Army. The Medical Department finds its patients sick in barracks or injured on the battlefield. It must provide first aid, transportation, hospitalization, and all the necessities for the treatment, as well as professional care itself. Following the general plan first clearly defined by Letterman (previously referred to), each regiment has its medical detachment, doctors and enlisted men who are trained to search out the sick, to give them necessary temporary care, and to prepare them for transportation to a hospital for definitive care. This may be accomplished either by litter or by ambulances; then we arrive at the hospital.

It has been the duty of the Medical Department to provide that hospital in its entirety, from foundation to shingle. Likewise it has been the duty of the Medical Department to provide every item of equipment needed therein, as well as the articles for treatment and transportation to this place of safety. It might interest you to note in passing that there are some seven thousand regular items on the Medical Department equipment list. I am particularly interested in the field we are discussing now because at the present time it is my particular duty to determine where our hospitals are needed, how large they must be and to secure their construction as a part of the regular building program.

With your permission I shall take up Section Four of our table and return later to the subject of hospitalization.



The graph showing the sick rate in the new mobilized Army follows almost exactly the anticipated course. During the summer and autumn it did not reach 3 per cent. It rises abruptly during December and January and begins to fall at the advent of milder weather in February and March. It is noted that the rise in January is well over 5 per cent, which justifies the Surgeon General in asking for hospital bed capacity of 6 per cent of the total strength; i.e., 5 per cent in Station Hospital beds and 1 per cent in General Hospital beds.

IV. Final Disposition

Every individual who comes into the Army must at some time leave its ranks. This is true whether he be a regular officer, an enlisted man, or a draftee called for but a year's training. If the individual comes to the normal termination of his service, the Medical Department needs only make a careful physical examination to complete the record for the protection of the government and of the individual. There are many, however, whose service must be terminated prior to a normal expiration because of the effects of disease or injury. It is the function of the Medical Department to relieve the armed forces of these individuals who are not fit to carry on. This is a determination which must be made by the army doctor. Out of fairness to the individual and to the government a complete record must be made, and of course from the standpoint of humanitarianism, the individual will not be discharged until he has attained maximum hospital benefit.

Since the last war we have had a new conception of the country's responsibility to the disabled soldier. This is evidenced by the existence of our Veterans Bureau facilities with many hospitals throughout the country so that after discharge from an army hospital the disabled veteran need not feel that should his condition require it, he would want for further medical care.

The accompanying chart is a graphic representation of the sick rate in the entire Army within the continental limits of the United States from August 31, 1940, through March 29, 1941. Judging from studies and records of the World War, The Surgeon General estimated that our total disability rate from illness and injury would be something over 5 per cent. It was estimated that we would require 5 per cent hospitalization in our station hospitals with an additional 1 per cent in our general hospitals—a total of 6 per cent. That this estimate of the situation was correct is clearly demonstrated by this graphic representation of the sick rate of the last several months.

I should like to state in closing that we have made many mistakes, many of them errors in judgment. Most blunders or errors have occurred because of inexperienced construction personnel. It should be realized that there were just not enough skilled carpenters in the United States to construct the buildings in the time required. We have even had buildings fall down because they were not properly constructed. Inexperienced workmen have been injured and even killed because they did not know how to handle the timbers for the erection of these simple buildings. The wild haste to do overnight something that should have taken years to accomplish, the attempt to buy time with money, has been very expensive, but has not been without results in which we can take pride.

The Army makes no apologies for the decision of its Commander in Chief deferring the mobilization of personnel until adequate shelter, including hospitals, had been provided. This has worked grievous hardship. Individuals and even whole divisions have received warning orders and prepared to go to camp on a certain date, only to find that date put off from week to week because barracks and hospitals had not been completed. We feel, and so advised the Chief of Staff and the President, that it would have been criminal to allow the American youth, in a training program—not a war—to go to military rendezvous without the necessary facilities.

I am glad to report to you that as far as I am able to find out, no American boy in the uniform has suffered or has died for the want of medical supplies or because there was no hospital bed available for his care.

NUTRITION AND NATIONAL DEFENSE*

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and
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WE are now engaged in a program of total national defense, and for this purpose we are mobilizing all of our national resources. Major industries have been reorganized to produce ammunition, guns, tanks and planes. But guns, tanks and planes are of no value without men. The supply of man power in the United States is not inexhaustible and modern weapons and war industry demand not only men but efficiency; men, as the President put it, "who are as good as their machines." The nutritional status of our armed forces has received first consideration, and rightly so, for they are our first line of defense. However, the armed forces ultimately will be no stronger and no more courageous than the people who support them. Battles have been fought and campaigns won without much thought being given to the nutritional status of the population at large, but famine has always contributed to defeat of armies and subjugation of nations. The courage, stamina, eagerness to coöperate and determination to win of collective peoples are national spirits which will determine the outcome of the present world-wide conflict and these spirits, so necessary if democracies are to survive the onslaughts now directed against them, are directly influenced by the nu-

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read by Dr. Williams before the meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

tritional status of the masses of people. In our efforts to mobilize *all* of our national resources we must not forget one potentially tremendous resource, the good health of the masses of people. The backbone of our defense program is yet the men in the factories, in the fields, in the mines and in the offices, and of no less importance than these men are the families on whose health and happiness the workers so much depend for giving their greatest efforts. You cannot put into heavy industry a man who has been subsisting on a deficient diet and expect efficiency, unless you first build him back into an efficient human machine.

Therefore, the aim of the nutrition program for national defense is to raise the nutritional status of the American people to a high level as quickly as possible, and once the emergency is passed, to consolidate gains already acquired and others surely to accrue as a result of awakened interest in the field of nutrition.

Need of Nutritional Front

Formerly it was thought that famine could be prevented if only supplies of food energy sufficed. The newer knowledge of nutrition teaches us that food energy is not enough to provide stamina for war. Procurement of energy in the form of nonperishable flour and sugar is a simple problem in the United States. But protein must be had, and a modicum, about a third, must be of high biologic value, namely, the proteins found in meat, eggs, milk, cheese and a few vegetables. Fat is a necessity aside from its energy value. Unsaturated fatty acids, such as linoleic acid, obtained with difficulty from other foods than fat, are essential. Fat hunger is a reality and the people of Europe now are feeling it. Fats also carry fat-soluble vitamins and provide for absorption of carotene, the provitamin A. Carbohydrate is essentially an energy carrier, and very little of it is necessary for nutrition if calories are provided from other sources.

In America, with its bursting granaries, there is little hunger for food energy but "hidden hungers" are prevalent. The newer knowledge of nutrition has emphasized the importance of what were once called accessory factors, namely, certain minerals and vitamins. Calcium in many diets is less abundant than desirable. An intake of less than 0.8 gm. per "consumption unit" is considered unsatisfactory, and such an intake is difficult to attain unless a pint of milk, or its equivalent of milk solids in other forms, is included in the day's food. Many people in Minnesota, a dairy country, fail to drink milk. Iron often is lacking in diets when leafy greens are avoided or the allowance of meat is small. Iron anemia is a prevalent deficiency. Vitamin deficiencies constitute the principal "hidden hungers" which until lately for the most part were unrecognized. Vitamins are the integers of the enzyme systems of the body, and lack of them gives rise to physical and mental inefficiency long before outstanding or recognizable disease appears.

Our knowledge of the incidence of nutritional deficiency diseases is rapidly growing. Statistics gathered from hospitals and nutrition clinics in most instances are based on only that group of people who have manifest evidences of deficiency states, that is, who have scurvy, rickets, beriberi, pellagra or ariboflavinosis, and they do not describe the incidence of deficiency disease in that large group of people who are in borderline states of nutritional deficiency. The latter group of persons just have "poor health," cannot do an "honest day's work" and may never seek the services of a physician. Critical analyses of purchases of food by Americans as reported by Stiebeling and Phipard of the Federal Bureau of Home Economics, give us indirect but nevertheless valuable information on which to estimate the probable incidence of deficiency disease in the group of employed wage earners. The report shows that no more than a quarter of the urban and rural families of the United States have diets that can be rated as good, that a little more than a third have diets rating as fair, and that another third or more have diets classed as poor. We have heard expressions of skepticism about these conclusions, but support for them comes from the findings of many independent dietary surveys in which the food actually eaten was measured and the people were examined by physicians. Wherever such surveys have been made the findings were much the same.

The actual incidence of nutritional deficiency states will be determined only after we have learned to recognize the early manifestations of deficiency syndromes, that is, before they have progressed to a state which can be called disease. Our conceptions of vitamin deficiency states have changed rapidly since easy availability of crystal-

line vitamin preparations has made it possible to induce an isolated vitamin deficiency under carefully controlled conditions. Jolliffe and his co-workers at Bellevue, and more recently Williams and his co-workers at the Mayo Clinic, induced isolated vitamin B_1 deficiency states in human subjects. During a study of only moderate restriction of thiamin, Williams and his co-workers observed that cheerful, happy, industrious young women became morose, depressed, fearful, irritable, uncoöperative, slovenly in personal appearance, easily fatigued, making numerous vague complaints of eye strain, headache, palpitation of the heart and dyspnea on exertion, capricious appetite, anorexia and gastric distress after meals. All of these signs and symptoms slowly disappeared when thiamin was provided in adequate amounts. In earlier studies[6] of severe restriction of thiamin, although heart failure, edema and polyneuritis—conspicuous features of classic beriberi—were not observed, objective evidences of irregularity of heart action, disturbance of gastro-intestinal function, impairment of the ability of the body to utilize carbohydrate and elevation of concentrations of certain chemical constituents of the blood were observed. But a most striking feature of the disease induced by the isolated withdrawal of thiamin was the fatigue and lassitude observed in all subjects after several weeks of restriction of thiamin. The disease induced by the isolated withdrawal of thiamin resembled, minutely in the early stages, the disorder which the discriminating psychiatrist designates as neurasthenia, or as it is commonly called, chronic nervous exhaustion.

Similarly, prepellagrous states are being recognized. J. S. McLester wrote: "Since J. B. McLester in his study of the histories of pellagrins seen at the Hillman Hospital in Birmingham made the significant discovery that an appreciable number of these patients had been admitted the previous year under the diagnosis of neurasthenia, we have made an effort toward the early recognition of such cases of subclinical pellagra. Many of the patients recently studied could with some justice be called neurasthenic, but when given nicotinic acid and thiamin, with a diet appropriate for pellagra, they recovered their nervous stability and sense of well-being to a remarkable degree. I believe that with a good history the prepellagrous state can be recognized without great difficulty and further progress of the disease stopped."

Recently Sydenstricker wrote: "In the chronic partial deficiency of B vitamins . . . mild psychic disorders may precede other manifestations by weeks or months. Neurasthenic complaints of all sorts are common. Slight mental retardation, loss of memory for recent events, apprehension, confabulation, depression or mild delusional states may recur for months or years. Partial deafness, particularly for high pitched tones, may be the presenting symptom. Digestive disturbances, particularly gastric discomfort after meals, burning of the esophagus and stomach, flatulence and constipation are almost invariable . . ."

Lund and Cranden, in a study of experimental human scurvy, observed, among other things, slight lassitude and ease of fatigue in the fourth and fifth months of the study, and marked fatigability began only in the sixth month. No ecchymoses occurred and no changes of the gums.

The point we wish to make is this: nutritional deficiency states, which we shall soon learn to recognize in the early stages, will be found principally in that large group of people who just do not feel well, who tire easily, who complain of nervousness, of palpitation of the heart, of indigestion and of insomnia; that is, the people who have a multitude of complaints and in whom organic disease rarely can be demonstrated. We have implied that nearly all clinical vitamin deficiency states have one characteristic in common—a vague feeling of ill health which may precede by months or years the frank manifestations of deficiency disease. The state of poor health comes on so gradually that oftentimes the patient cannot date its onset, cannot attribute a cause and may be astonished to learn the true nature of his illness. Substantial evidence clearly indicates that a large portion of our population, rich and poor, young and old, subsist on intakes of certain vitamins and minerals which are incompatible with vigorous health, and to this extent the health and welfare of the nation are impaired.

The Nutritional Front: Plans and Personnel

The importance of the nutritional front received early recognition as the existing emergency developed, and a planning and policy committee on nutrition, representing different agen-

cies of the government, with Mr. M. L. Wilson of the Extension Service, Department of Agriculture, as chairman, was appointed. The committee now is advisory to the Director of the Office of Defense Health and Welfare Services, Mr. Paul V. McNutt. Plans to mobilize the scientific talent and educational resources, not only of the Federal Government but of the nation, are being put into effect.

The plans involve: (1) reinforcement of present activities of the many agencies of the government that have nutritional programs; such agencies as the Federal Security Board, United States Public Health Service, Extension Service and Bureau of Home Economics of the United States Department of Agriculture, the Maternal and Child Health Section of the United States Children's Bureau, the Home Economists of the Works Progress Administration, and others; (2) measures for increasing the food purchasing power of the low income group in which extension of the stamp plan of the Federal Surplus Commodities Corporation may be sought; the school lunch program looms large and must be extended; (3) measures directed to improving the nutritive quality of staple foods with special emphasis at first on flour and bread; (4) measures for disseminating information on food selection through the medium of the press, magazine, radio, lectures, and so forth; (5) the assistance of professional groups, foremost that of physicians. Support from the family physician is indispensable, but so also is that of dentists, nurses, dietitians, social workers and others who can influence nutritional practices.

In our democratic country the masses of people must accept national problems and methods of solving them before effective action can be taken. If we can bring the masses of people to understand the nature and extent of the problem of malnutrition and the application of the simple principles by which dietary deficiencies can be corrected, we shall have gone a long way toward the goal of improving the health of the nation and fortifying one of our many lines of national defense. Education of the public in nutritional practices is largely in the hands of groups who work intimately with the people. No other group in the state of Minnesota can have greater influence on dietary habits of the people than the practicing physicians and their help is urgently needed for effective application of plans for "making America strong by making Americans stronger."

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PHYSICAL DEFECTS OF SELECTEES*

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WITH the enactment into law of the Selective Training and Service Act of 1940 by the Seventy-sixth Congress, a vast machine for the procurement of men for a rapidly expanding defense program was authorized.

For administrative purposes, the President established a National Selective Service Headquarters and authorized the Governor of each State, who is responsible for the administration of the act, to establish a State Headquarters under a State Director and delegate to it the administration of the Act within the State. Thirty days after passage of the Act sixteen and a half million men, between the ages of twenty-one and thirty-five years, were registered for Selective Service on October 16, 1940. Of this number,

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

331,285 were registered in the State of Minnesota.

In each of Minnesota's eighty-seven counties at least one local board was established and in order to have a local board available for each 30,000 of population, in a number of counties, two or more boards were established, making a total for the State of 137. These boards are composed of three or more members appointed by the President, upon recommendation of the Governor. They were chosen from male citizens of the United States who are not members of the land or naval forces and preferably residents of the area for which their board was appointed, or at least residents of the county in which their local board has jurisdiction.

The duties of the local board are classification, selection and delivery for induction. On the successful and just execution of these duties depends entirely the success of the Selective Service System. The Act authorized the appointment by the President, on the recommendation of the Governor, one examining physician for each local board to examine registrants for the local board but not to serve as a member of the local board, as in 1917-1918. While one physician only was appointed for each board in the beginning, the Act authorized the appointment of additional examining physicians at the request of the local board. So that beginning with 137 examining physicians in October, at the present time we have 664. Recently the appointment of dental examiners for each board has been authorized and to date we have 235 dental examiners for local boards.

The Act authorized the establishment of Medical Advisory Boards to be made up of one or more of each of the specialties for each board, so that at the present time we have nine Medical Advisory Boards with 142 members who are daily rendering opinions in difficult cases referred to them by examining physicians or local boards.

To date then, approximately 1,000 members of the medical and dental professions have examined over 35,000 registrants in the State of Minnesota; 64 per cent of these have been found to be fit for general military service; 13 per cent fit for limited military service, having certain minor defects which prevent them from being certified as fit for general service; and 23 per cent have been disqualified as unfit for any military service.

DEFECTS CAUSING DISQUALIFICATION

	1941	1917-1918
Teeth (insufficient)	29.0	3.1
Cardiovascular	16.0	13.1
Nervous and Mental Disorders	9.0	10.3
Musculoskeletal	9.0	12.3
Multiple defects	6.0	
Ears	5.0	4.4
Eyes	4.0	10.6
Endocrine	2.0	
Gastro-intestinal	2.0	
Hernia	1.8	6.0
Respiratory	2.0	
Genito-urinary	1.8	2.6
All others	7.0	

The situation in Minnesota with regard to syphilis, as disclosed by serological examination of every registrant physically examined, is gratifying. From November 6 to April 13, 30,891 serological examinations were performed on 30,333 registrants. Of this number of examinations 181 positives were found, 105 of these 181 positives being known cases that were already under treatment, leaving 76 new cases discovered in 30,333 men.

The causes for rejection by local board examiners and members of the examining team at the induction center are numerous. However, without wishing to burden you with statistical data, I might say that the chief cause for rejection by the examining physicians for the local board and the induction center is insufficient teeth. Approximately 29 per cent of the registrants found not fit for general military service by both the examining physicians and the induction board were rejected by reason of insufficient teeth. Approximately one out of six were rejected because of cardiovascular defects. One out of ten of the rejections were due to musculoskeletal or orthopedic defects or diseases of the bones and joints. One out of ten was rejected because of insufficient vision, hearing, or diseases of the ears or eyes which were disqualifying; and one out of ten for nervous and mental disorders.

The reasons and percentages of rejections for certain causes at the present time are about parallel and comparable to the defects causing rejections in 1917-1918, with the one notable exception that while at this time 29 per cent of the

rejections are due to insufficient teeth, this defect or deficiency caused only 3 or 4 per cent of the rejections in 1917-1918. Whether this is indicative of a lack of care with resultant deplorable conditions of the teeth at the present time in comparison with that of 1917-1918, or whether it is indicative simply that standards are being more rigidly applied at the present time, I am entirely unable to state.

To April 30 of this year, 10,682 men were forwarded to the induction center at Fort Snelling by the local boards. Of this number, 1,236 or 11.6 per cent were rejected at the time of the final type physical examination performed by the induction board, for physical reasons. It is interesting to note the variation in percentage: 2.4 per cent of the total delivery by one board were rejected while 28.3 per cent of those delivered by another board were rejected, the average being stated above, 11.6 per cent for all boards.

The figure of 11.6 per cent of rejections at the induction center is slightly below the average for the Nation, and far below figures for some of the other States. However, the rejection of one out of every eight or ten men delivered to the induction center has ben the cause of much criticism of the Selective Service System, the standards for physical examination and the profession. It means that in many cases, registrants have left their occupations or disposed of their business, said good-by to their families and friends, planning for a year's service and training and several days after their departure for the induction center they are returned to their home station, considerably lower in spirit and morale than on their departure and ofttimes without a job.

To remedy this situation, numerous plans have been advocated. One plan suggested the elimination of the preliminary examination by local board examiners entirely, and the forwarding of all registrants to the induction center where they would submit to the final type of examination, following which those found fit for general military service would be inducted in their proper order. A second plan suggested a traveling induction board made up of Army Officers, which would tour the State and examine registrants at numerous points throughout the State. A plan which is being tried this month in Pennsylvania, proposes the continuance of the examination as heretofore by physicians for local boards, this examination to be followed by the final type examination by an induction board several weeks previous to induction at various points in the State convenient to groups of registrants. Local boards, under this plan, would order groups of registrants to a certain point in the locality where they would be examined by an induction board composed of Army Medical Officers, or of available civilian specialists in the vicinity, and after the completion of the examination, registrants would return to their home station. They would then know definitely their physical status several weeks prior to induction and on notification that they were to be inducted could make their plans for leaving their jobs or disposing of their businesses with the assurance that on induction they would be accepted into the Army for a year's training.

At the present time tentative plans are being made in each State in an attempt to avoid registrants being returned from the induction center because of rejection for physical disability. When a workable plan has been perfected to accomplish this, I am sure that one of the few causes for criticism of the Selective Service System will have been eliminated.

NEW ARMY IN EXCELLENT HEALTH

It should be a source of great public satisfaction that the health of America's new army is being maintained at a high level. This reflects both the careful selection of the men and the high quality of the medical supervision and care provided for them. While no separate figures are collected for the recent selective service men, they have come to form so much the greater part of the forces in service in the United States that, more and more, the current sickness experience of the army applies to them in particular.

For several months now—from April to August 1941—the total rate of admission to "sick report" for disease has run appreciably lower than in the corresponding period of 1918. The current experience is even more favorable when we consider that military training now makes greater physical demands than a generation ago. Moreover, soldiers are now encouraged to report illnesses, however minor, to prevent their becoming serious as a result of complications; in fact, some of the disorders now recorded would not usually cause absence from work in civilian life.—*Statistical Bulletin,* Metropolitan Life Insurance Company, September, 1941.

MEDICAL OFFICERS OF THE FUTURE*

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WHEN the Program Committee invited me to participate in this symposium and discuss the subject, "Medical Officers of the Future," I feel sure that they intended that I should consider the special qualifications and training which physicians should have in order to be able to meet the future medical needs of our armed forces. Before turning to this aspect of the subject, however, I should like to discuss briefly with you the vital and even more fundamental problem of providing an adequate supply of medical officers to meet the demands of our defense program.

Necessity for Continuance of Medical Training

Briefly stated, the situation with which we are faced is this: For the present Selective Training and Service program the Army will require 7,900 physicians, in addition to the 1,200 medical officers in the regular Army. If the training program is expanded or there is a general mobilization, this number will be proportionately increased. For example, if there should be a mobilization of four million men, the Army will need to call approximately 25,000 physicians from civilian life.

In addition to this the Navy will need approximately 900 additional physicians for their expanding program; the new and enlarged defense industries will require the services of many physicians; the Public Health Service needs more doctors, and experience shows that modern warfare increases enormously the need for medical services among the civilian population. Recently the British Red Cross has urgently requested 1,000 American physicians for duty in England.

The question naturally arises as to why the military training program or mobilization creates a shortage of medical services when the same individuals who are in the armed forces were previously supplied with medical care in civilian life. The answer is that the quota of medical services in the armed forces is approximately five times as high as it is in the civilian population: namely, 6.5 per thousand individuals in the Army as compared to approximately 1.5 per thousand in the civilian population. In the training program such a high ratio of physicians may not be necessary but in order that the armed forces may be properly and effectively trained for actual warfare it is considered important that all units of the service be trained for effective coordination at combat strength.

As I have already pointed out, for the present training program of 1,400,000 men, the Medical Corps of the Army will require approximately 8,000 physicians from civil practice. Of these, a few will be inducted by Selective Service but most will be physicians who hold commissions in the National Guard or the Medical Reserve Corps.

To withdraw 8,000 physicians from practice will create shortages in medical service in certain areas. The adjustments which are necessary to meet this situation constitute one of the problems facing the medical profession today.

The Surgeon General's Office estimates that possibly 50 per cent of the physicians who go into military service from civil life will be willing to continue in the service for more than one year. This estimate seems to me rather optimistic but even if it should prove correct, it will require 4,000 new physicians for the military service each year to replace those who return to civil practice.

In normal times it requires from four to five thousand medical graduates annually to take the place of the physicians who discontinue practice because of age, disability or death. Therefore, the physicians who return to civil life after a year of military training will be barely enough to provide for this replacement.

This leaves the question of an annual replacement of 4,000 physicians for the military services, in addition to the provision of approximately 500 to 1,000 physicians for replacements in other governmental services. The Surgeon General of the Army estimates that the Medical Reserve Corps will be exhausted by July, 1942, hence, it is obvious that these replacements must come primarily from the graduates of our medical schools. The approved medical schools of this

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country are able to graduate about 5,000 physicians a year. It is estimated that 30 to 40 per cent, or at least 1,500, of these will not be qualified for Army service because of physical defects, sex, prior commissions in the Navy, dependents, etc. This leaves only approximately 3,500 medical graduates available to serve as medical officers. From these data it is obvious that even if the number of graduates from medical schools is continued at the present level and every physically qualified graduate enters military or naval service upon graduation, it will still be necessary to draw an additional 1,500 physicians from the civil population each year in order to meet the needs of the armed forces.

The reason for bringing this to your attention is that at the present time, the responsibility for granting deferment of military service to medical students rests with Local Boards or Appeal Boards of Selective Service. If medical students are withdrawn from school and inducted into the army, the vacancies in their classes remain unfilled because there are no replacements available. The inevitable result will be a decrease in the number of physicians to be graduated in the years ahead. Furthermore, if these students return to complete their medical courses after their military training, they will have discharged their obligations under the Selective Training and Service Act and so cannot be expected to accept additional training service after graduation.

The National Headquarters of Selective Service has advised Local Boards of their authority to grant deferment to students who are considered "necessary men" in training for an occupation or profession which is essential to the "national health, safety or interest" and in which there is a present or probable shortage of trained personnel. In addition, both National Headquarters and Minnesota State Headquarters have issued memoranda to Local Boards providing data and factual information concerning the need for and relative shortage of physicians, and advising that no student "who gives reasonable promise of becoming an acceptable medical doctor be called to military service before attaining that status." This is as much as National and State officers can do under the law. The ultimate decision rests with Local Boards or Appeal Boards.

The University of Minnesota has given careful consideration to the problem of deferment of military service for students and has decided to recommend deferment for those students who, in the opinion of the appropriate University authorities, should be granted deferment in accordance with the provision and intent of the Selective Service Act. Medical students are included in the preferred groups for whom recommendation will be considered. There will be no group recommendations. Each individual student will be given special consideration on the basis of his progress to date, his class standing, and the probabilities of his successful completion of the course within a reasonable time. Recommendations will be initiated by the Dean, passed upon by the University Committee on Deferment of Military Service and transmitted to the President for his consideration and recommendation to the Local Boards.

It is our hope that Local Boards will act favorably upon these individual recommendations, each of which will have received careful consideration by the University before submission to the board. In order to obtain favorable action, however, it is essential that Local Boards have a clear understanding of the situation. They must understand that no exemption from military service for these students is even suggested. Every one of them who is physically fit will be obligated to go into the military service upon the completion of his medical course. Under the present law this is the only way in which our armed forces can obtain the services of the physicians which they need. The only alternative would be a special draft for physicians, and even that would create serious shortages of medical service for the civilian population. To avoid such catastrophe, it is essential that physicians, health officers and others who understand the urgency of the situation do everything in their power to convince Local Selective Service Boards that deferment of military service for medical students is essential both for the defense program and for the national welfare.

Special Qualifications for Medical Officers

Next, let us turn to the more direct consideration of the subject assigned to me: namely, the qualifications of Medical Officers of the Future. In view of the inevitability of military or naval service for every qualified medical graduate it is obvious that our medical schools have become

training institutions for medical officers as well as for physicians to serve the civilian population. This raises the question as to the type of training that these future medical officers should have. First and foremost every medical officer must have a sound and thorough medical education. Specific evidence of the official recognition of this basic requirement is the regulation that only graduates of approved medical schools are eligible for commissions in the Medical Corps of the Army and the Navy. This much is an accepted requirement. The next question is whether the curriculum which has been formulated primarily for the training of civilian physicians should be modified for the training of medical officers, and, if so, in what manner.

The Care of Emergencies

The needs for medical services in times of war are largely of an emergency nature. In modern warfare this is just as true among the civilian population as among the armed forces. Consequently, physicians will be called upon to meet many more emergencies of all types than in peacetime practice.

With this in mind the medical faculty of the University of Minnesota introduced, approximately a year ago, a special course in first aid for freshmen medical students. The instruction and practice in this course provides these students with a background for dealing with most of the emergency situations with which they may be confronted either as medical students or as physicians. This course has been popular with the students and in addition to its own intrinsic value it has served to stimulate their interest in certain of the fundamental science courses such as anatomy which they are studying at the same time.

The medical officer must be familiar also with the best methods of dealing with the special hazards of modern war, such as various types of wounds, burns from gas, incendiary bombs and flame throwers, poison gas inhalation, etc. Special bulletins on these topics are being prepared for the Medical Department of the Army by special committees of the National Research Council. Copies of these may be obtained from the Government Printing Office.

Special Physical Examinations.—Important among the special skills of medical officers is the ability to make discriminating physical examinations of new recruits. It is essential both that disqualifying defects be recognized and that unimportant physical findings be properly devaluated. Tuberculosis alone among the soldiers of the last war has already cost this country approximately a billion dollars for hospital care, insurance, compensation and vocational training, and these expenditures are still continuing at the rate of about three million dollars per month. Some of these infections doubtless were acquired in service, but unquestionably the great majority of them were present, although unrecognized, at the time that the infected individuals entered the service. It has been estimated that it costs about $10,000 to induct a man suffering from tuberculosis and about $50 per month thereafter, plus compensation benefits for his dependents after death.[1] The use of modern diagnostic techniques makes it possible to recognize practically all of these infected individuals at the time of the examination. Our medical officers should be trained and provided with the facilities to use these techniques.

Other aspects of the physical examination for which special skills are necessary are the interpretation of heart murmurs, the estimation of cardiovascular efficiency, the neuropsychiatric examination, and examination of the eyes and ears, particularly for aviators.

Psychiatric Problems of War Time.—Medical officers of the future need to be specially trained in the field of psychiatry. War has always precipitated latent emotional instabilities into incapacitating psychoses or psychoneuroses. During the past war we labeled many of these as shell-shock. By so doing we felt, all too frequently, that we had accomplished something, although the understanding and the treatment of the patient was not improved in the least by the use of this new terminology. The loss in efficiency of the armed forces occasioned by emotionally unstable soldiers is enormous and the cost to our government for the care of the psychiatric patients in the last war has long since passed the billion-dollar mark.

In building an army, the emotional stability and morale of the soldiers are of vital importance. Modern warfare utilizes the instillation of fear and the war of nerves as potent weapons. The dive bombers, screeching shells, incendiary bombs, parachute troops, sabotage, interruption of communications are demoralizing in their ef-

fect. French resistance melted under it when pitted against the German army whose morale, according to William Shirer,[7] was "fantastically good." As an example, he mentions "a company of engineers that was about to go down to the Scheldt River to lay a pontoon bridge under enemy fire. The men were reclining on the edge of a wood reading the day's edition of the army daily paper, the *Western Front*. I have never seen men going into battle from which some were sure never to come out alive so—well, nonchalant."

Under such conditions emotionally unstable soldiers are not only worthless to an army but a distinct liability. They never make good soldiers and as many of them as possible should be excluded at the time of the entrance physical examination. Special skill, care, training and time are necessary to identify these potentially psychopathic individuals and prevent their induction into the Army. Many, however, are certain to again get into our Army. For these the medical officer must be constantly on the alert. Under military training, emotionally unstable individuals are almost certain to exhibit suggestive symptoms. Their commanding officers may note that they do not accept discipline or develop well under training. Such symptoms should be called to the attention of the medical officer, who, in turn, needs special training and experience to deal effectively with these problems.

At the University of Minnesota we have been able, during the past few years, to greatly strengthen the psychiatric training of our medical students. The addition of the psychiatric unit to the University Hospital has enabled us to institute clinical clerkship training in this field. Still more recently we have been able to add experience in the Psychiatric Clinic for Children, where the students have had an opportunity to study the diagnosis and treatment of emotional instability in its early stages. All of this, however, will be supplemented for these future medical officers whom we are training with special instruction concerning the psychiatric problems of modern warfare.

Public Health Responsibilities of Medical Officers.—Another major responsibility which a medical officer must assume lies in the field of public health, particularly in epidemiology and sanitation. It is the medical officer in the Army who is responsible for the prevention and control of communicable diseases, for the general sanitation of the camp, and for the safety of food, milk and drinking water. Upon his competence in these fields may depend the health and effectiveness of large numbers of troops. Outbreaks of epidemic diseases practically always accompany the mobilization of armies. During the last war, measles, mumps, meningitis, influenza and pneumonia occurred in epidemic proportions in many of the camps and greatly reduced the effectiveness of large units of the Army. Adequate safeguards over food and drink can easily be established in permanent or semi-permanent camps; but the modern, rapidly moving army, frequently operating in small units, must be prepared to meet these hazards in an emergency manner. Medical students are regularly given instruction in these subjects but additional emphasis needs to be placed upon them in order that our graduates may be qualified for these special responsibilities which they will be called upon to assume.

Administrative Responsibilities.—Still another requirement of the competent medical officer is an understanding of the organization and operation of an army and particularly of its medical department. In time he will learn much of this by experience but he will be able to discharge his responsibilities more promptly and more efficiently if he has as much familiarity with his duties as possible before being called upon to accept them. In our defense program time is an all important factor. Special series of lectures are being given to our senior medical students who are not in the Reserve Officers Training Corps course to acquaint them with the administrative duties and relationships of medical officers.

Need for Specialists.—These are some of the qualifications which medical officers as a group should possess. In addition, the medical officer in special situations needs still further qualifications. The surgeons, the internists, the radiologists, and the other specialists who are assigned to military or naval hospitals need to be thoroughly competent in their specialties and familiar with their application to war casualties. The flight surgeon must be skilled in the physical examinations required of aviators and thoroughly acquainted with the special medical and health problems of aviation, such as fatigue, aerial

equilibrium, air sickness, effects of decreased atmospheric pressure, evacuation of war wounded by airplane ambulance, etc.

Medical schools have recognized their responsibilities for the better preparation of medical officers and are attempting to meet them. The Army will provide a certain amount of training as well as experience for medical officers after they are called to active service. In addition to all this, the individual physician should prepare himself, so far as possible, for the special responsibilities which he may be called upon to assume either in the armed forces or among the civilian population during the modern war. Much can be done in this regard with the aid of such books as "The Military Medical Manual";[5] Dunham's "Military Preventive Medicine,"[6] Armstrong's "Aviation Medicine,"[1] the bulletins published by the Government Printing Office for the Medical Departments of the Army and the Navy, the Medical Preparedness Section of the *Journal of the American Medical Association,* and the new journal entitled *War Medicine* published by this same association.

As a profession let us prepare ourselves as quickly and as effectively as possible for the important part which medicine must play in our National Defense Program.

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CHEMOTHERAPY IN THE TREATMENT OF STREPTOCOCCAL INFECTIONS*

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THE use of chemotherapy in the treatment of infections produced by pathogenic bacteria belonging to the rather large group classified as streptococci has modified the practice of medicine greatly in the past few years. The variability of the response of infections due to different strains of streptococci is an important factor in the selection of the drug most suitable in each instance. The proper selection of the drug of choice, the dosage and the method of administration are by far the most important considerations in determining the results obtained in this form of treatment. An attempt will be made here to record on a basis of our experience the methods of choice in the treatment of various types of infections in which streptococci have been the etiologic agent.

Infections Due to Hemolytic Streptococci

In general, infections due to hemolytic streptococci may be classified in three major groups: (*A*) those infections resulting in a very acute fulminating disease in which high concentrations (12 to 16 mg. per 100 c.c. of blood) of the drug in the blood stream are not only desirable but imperative in order to obtain satisfactory results. In this group will be found septicemia, meningitis, fulminating infections of tissues including erysipelas, puerperal sepsis with peritonitis, and so forth. The second group of infections (*B*) includes those which are moderately severe but in which lower concentrations of sulfonamide compounds (5 to 9 mg. per 100 c.c. of blood) are satisfactory. In this group will be found abscesses, adenitis, cellulitis, lymphangitis, tonsillitis and peritonsillar abscess, and sinusitis. A third group of infections (*C*) in which low concentrations (3 to 4 mg. per 100 c.c. of blood) are required includes infections of the urinary tract.

Chemotherapy in Group A.—It is in the first group of cases referred to that the adequacy of treatment is of prime importance. Sulfanilamide still remains the drug of choice in the treatment

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read by Dr. Herrell before the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

TABLE I. SULFONAMIDE TREATMENT FOR STREPTOCOCCAL SEPTICEMIA

Comparison of Results in Cases With and Without Treatment

Organism	Sulfonamide compounds 1937–1940			No sulfonamide compounds 1934–1940*		
	Total patients	Recovered No.	Recovered %	Total patients	Recovered No.	Recovered %
Hemolytic streptococcus	47	30	64	69	19	28
Streptococcus (green producing) †	12	9	75	7	5	71

*Quantities under this heading include those patients who, although the drugs were available through part of the period concerned did not, for some reason, receive them.

†There were also 177 cases of subacute bacterial endocarditis from 1934 to 1940, inclusive, with no recoveries regardless of type of treatment.

of septicemia due to hemolytic streptococci. The drug may be administered by mouth or subcutaneously. Initial doses of 3 to 3.5 gm. followed by 1 gm. at four-hour intervals throughout the day will result usually in adequate concentrations. Sulfanilamide administered subcutaneously, for instance, 0.8 per cent solution in saline, is used only in treatment of patients who are unable to take medication by mouth. In such cases our procedure has been to administer 400 to 500 c.c. of such a solution as an initial dose and to repeat the subcutaneous medication every six to eight hours as necessary to maintain the desired concentrations in the blood. The additional administration of sodium bicarbonate, 40 to 60 grains daily, is indicated, since acidosis develops in some instances when patients receive sulfanilamide.

Sulfapyridine given orally or intravenously in the form of sodium salt in a 5 per cent solution in distilled water may be used also in the treatment of hemolytic streptococcal infections of the severe type. In fact, this drug is particularly suitable in the treatment of streptococcal meningitis. These patients often are unable to take medicine by mouth and the intravenous use of sodium sulfapyridine affords a method of quickly arriving at concentrations desirable in the treatment of meningitis. Soon after the administration of 50 to 75 c.c. of the solution, the concentration in the blood will range between 4 and 5 mg. per 100 c.c. If the total daily intake of fluid does not exceed 3,000 c.c., the concentration of sulfapyridine may be maintained by repeating the intravenous doses at six-hour intervals. Sulfathiazole is not considered useful in the treatment of meningitis due to hemolytic streptococci, since it has been shown that this drug does not diffuse readily into the cerebrospinal apparatus.

Perhaps the greatest single factor in the possible recovery of a patient suffering with either septicemia or meningitis is the adequacy of treatment and likewise the most important single factor concerned in the adequacy of treatment is the maintenance of a concentration of sulfonamide compounds between 12 and 16 mg. per 100 c.c. of blood. This is indicated clearly in the results which were reported by us[4] in the treatment of septicemia over a three-year period between 1937 and 1939. Approximately 70 per cent of patients suffering from hemolytic streptococcal septicemia recovered if adequately treated. On the other hand, the recovery rate was only 30 per cent in the cases in which treatment was inadequate. This recovery rate in the latter group is no better than the recovery rate reported by Rosenow and Brown for a similar period before sulfonamide compounds were available. This observation serves merely to reëmphasize the fact that, if one is not willing to treat patients with these drugs in amounts necessary to maintain the blood concentrations at the higher levels, the results are no better than if chemotherapy is completely withheld from the patient.

A recent analysis of the results in the treatment of septicemia including our experience for the past four years again emphasizes this factor vividly (Table I). Failure to recover from septicemia can be explained now only on one or two factors. The first is the question of adequacy of treatment, in which lies the only hope for improvement in recovery rates in this group of cases. The other factor which will account for failures if patients are treated adequately is the development of a vegetative heart lesion or infected thrombophlebitis during the course of treatment. When such a condition ensues, one is dealing with a focus in direct communication with the blood stream, and such a focus results in a prognosis identical with that which exists in the treatment of subacute bacterial endocarditis.

It has been pointed out previously that the factor of age has been considered very significant in the possible recovery of a patient suffering with septicemia. For example, Rosenow and Brown reported a 9 per cent recovery rate among

patients fifty years of age or more suffering from hemolytic streptococcal septicemia up until 1936. In the past four years, since the advent of chemotherapy, we have observed a recovery rate of 59 per cent among patients fifty years of age or more (Table II). Better than a sixfold improvement in a recovery rate for patients in this age group is ample justification not only for the existence but the continuation of the methods which have been employed.

Chemotherapy in Group B.—The early oral administration of adequate doses of sulfanilamide or azosulfamide (neoprontosil) in the group of cases classified here in group B is perhaps the greatest single factor in the prevention of the development of the more severe complications of streptococcal infections found in group A. The early administration of these drugs in treatment of ordinary abscesses, cellulitis, lymphangitis and even sinusitis not only may shorten the course of the patient's illness but at the same time may prevent septicemia and meningitis, the mortality rates for which are extremely high. In order to maintain concentrations sufficient to overcome this group of infections, it is seldom necessary to employ more than 4 to 6 gm. of the drugs daily. Even in some of these conditions it may be necessary at times to administer sulfanilamide subcutaneously, but as a rule this is not necessary in this group of cases. One significant feature to be stressed in the management of these conditions is the continuation of chemotherapy until after all signs of the acute infection have subsided. As a rule it is better to discontinue the administration of sulfonamide compounds in all of these cases gradually rather than to terminate treatment abruptly. Many of the patients in this group may be ambulatory, although no rule may be employed concerning this aspect of their management except clinical judgment.

Chemotherapy in Group C.—The management of patients suffering with infections which fall into group C is somewhat more simple than the management of patients in the two groups previously described. Here the concentrations in the blood of sulfonamide compounds, either sulfanilamide, azosulfamide (neoprontosil), sulfapyridine or sulfathiazole, are relatively unimportant. For the average adult small daily doses of 2 or 3 gm. usually will produce urinary concentrations which are adequate in the treatment of these infections.

TABLE II. SULFONAMIDE TREATMENT IN HEMOLYTIC STREPTOCOCCAL SEPTICEMIA
Age Factor in Cases With and Without Treatment

Age, years	Sulfonamide compounds			No sulfonamide compounds		
	1937–1940			1934–1936		
	Total patients	Recovered		Total patients	Recovered	
		No.	%		No.	%
0–24	11	10	91	14	8	57
25–49	19	10	53	25	8	32
50 and more	17	10	59	22	2	9
Total	47	30	64	61	18	30

Infections Due to Green-producing Streptococci

In the infections from which may be recovered streptococci belonging to the so-called viridans group of organism, the clinician is confronted with perhaps one of his most difficult problems in chemotherapy. Fortunately, however, most of the infections due to streptococci in this group respond fairly well to either sulfanilamide or sulfapyridine, provided that the organism is not an enterococcus or Streptococcus fæcalis.

Fortunately, infections resulting from the enterococcus or Streptococcus fæcalis group are not very common. Only one case of septicemia associated with Streptococcus fæcalis has been observed in the Mayo Clinic in the past four years. Sulfathiazole is by far the drug of choice in the treatment of infections due to this organism. Negative blood cultures were obtained easily by the use of sulfathiazole in the case referred to.

Subacute Bacterial Endocarditis.—Many claims colored by therapeutic enthusiasm have been made concerning the effectiveness of chemotherapy in the treatment of subacute bacterial endocarditis. From 1934 to 1940, inclusive, 177 cases of subacute bacterial endocarditis were observed in the Mayo Clinic. Combinations of sulfanilamide, sulfapyridine and the thiazoles have been used repeatedly in different groups of these patients. The sulfonamide compounds have been given alone and in conjunction with fever therapy and with intravenously administered heparin.

One report on a selected group of these cases has been made by Krusen and Bennett. To date we cannot record a single recovery resulting from this method of treatment. There are, no doubt, a few scattered cases in which recovery has occurred, but recovery was reported before the advent of sulfonamide compounds.

The failures resulting from chemotherapy in subacute bacterial endocarditis cannot be recorded, however, because of the inability of sulfonamide compounds to inhibit most of the organisms in the group known as green-producing streptococci. The failure is purely because of the presence of a focus in direct communication with the blood stream which cannot be eradicated. Ample evidence is present to attest the effectiveness of sulfonamide compounds against most of the organisms in the green-producing streptococcus group. For example, during the period from 1937 through 1940, 75 per cent of patients who had positive blood cultures or septicemia without bacterial endocarditis recovered under adequate treatment with sulfonamide compounds (Table I). Sulfanilamide and sulfapyridine were the drugs used in all of these cases with the exception of the one case referred to in which Streptococcus fæcalis was present.

In the ordinary or mild infections of the urinary tract associated with the presence of a green-producing streptococcus, sulfanilamide or sulfapyridine usually will produce the desired results providing, of course, the foci are eradicated adequately. In the treatment of infections due to Streptococcus fæcalis, the thiazole derivatives are the drugs of choice.

Infections Due to Anaërobic Streptococci

It is generally agreed that neither sulfanilamide, sulfapyridine nor sulfathiazole is effective against infections due to anaërobic streptococci. Since most of these infections may have associated streptococci which do not belong to the anaërobic group, it seems reasonable to continue the use of these drugs, although it seems reasonably certain that they may not affect the anaërobic organisms. This treatment in itself may be enough at times to swing the balance in favor of the recovery of a patient who may be suffering with a severe infection due to a mixed group of organisms.

Local Chemotherapy in Streptococcal Infections

Sulfonamide compounds may be used locally in one of two ways in the management of streptococcal infections: (1) as prophylaxis against infection, and (2) to treat infection already existing either in superficial tissues or in body cavities.

The drugs may exert a local bacteriostatic effect or in some instances they may stimulate local tissue resistance. It seems fairly certain at any rate that the local use of sulfonamide compounds exerts a beneficial effect on the healing of infected wounds. This effect cannot be explained purely on the basis of the presence of sulfonamide compounds in the general circulation after their local application, because clinical response often has been far beyond that which might be expected from concentrations resulting from local application.

In the treatment of superficially infected wounds we have used sulfanilamide and in some instances sulfathiazole[3] in the treatment of infections associated with streptococci. Sulfapyridine has not been used. The agents may be applied in the form of a dusting powder or in the form of wet dressings which consist of sulfanilamide in saline solution. Both of these drugs have been placed directly into compound fractures. Definite beneficial results have been observed not only therapeutically but prophylactically in the treatment of infections of bone. Since sulfonamide compounds do not concentrate in osseous tissue, the higher concentration resulting from their direct implantation into these tissues is a distinct advance in the treatment of infections which occur primarily in bone. Both sulfanilamide and sulfapyridine may be used to advantage in the irrigation of empyematic cavities associated with infections due to a streptococcus.

The direct implantation of either sulfanilamide or sulfathiazole in amounts of 75 grains (5 gm.) directly into the peritoneal cavity at the time of operation for a ruptured or abscessed appendix as well as other bowel lesions has reduced markedly the mortality and morbidity rates associated with these conditions in the past two years at the Mayo Clinic. While most of these conditions are associated with other organisms in addition to streptococci, streptococci are nearly always present. Concentrations of the drugs may reach 400 to 600 mg. per 100 c.c. in the peritoneal exudate

after this procedure and the convalescence of the patient is markedly benefited. Objections have been raised by some to the use of these drugs locally, primarily on the basis of possible hepatic damage because of the possibility of high concentrations of these drugs in the portal system. This objection is without foundation in fact. All sulfonamide compounds absorbed from the intestinal tract after oral administration of doses which are far in excess of 75 grains daily must reach the liver and the general circulation through the portal system. This fact in itself would render untenable the belief that intraperitoneal implantation of 75 grains of either of these compounds is associated with any danger of hepatitis. Hepatitis with jaundice is more likely to follow suppuration and peritonitis when sulfonamide treatment is not given than when it is given.

Gramicidin Treatment of Streptococcal Infections

Since the description of gramicidin, a substance isolated from a soil bacillus by Dubos, much interest has been aroused concerning its possible use in the treatment not only of streptococcal infections but of all infections associated with Gram-positive organisms. This substance is a highly effective bacteriostatic agent for most of the Gram-positive pathogenic bacteria commonly encountered. The recent observations by Heilman and one of us (Herrell)[2] concerning the hemolytic effect of this substance render it unsafe at the present time for general use, especially where the substance may come in direct contact with the blood stream. Recently one of us (Herrell) and Heilman[5] have reported on the use of crude gramicidin (tyrothricin) in the local treatment of wounds from which streptococci as well as other Gram-positive organisms have been isolated. This substance does not appear to produce any damaging effect on the tissues. In fact, the wounds heal well after its use. This latter effect may not result from any stimulating influence of gramicidin on tissue but rather from the bacteriostatic effect of the substance against most forms of streptococci commonly encountered. The substance is in no way related to sulfonamide compounds and preliminary observations would tend to indicate that its action is entirely unlike the action of any of the sulfonamide compounds. If the hemolytic property of this interesting substance, gramicidin, can be removed and at the same time its bacteriostatic effect can be preserved, an entirely new approach may ensue in the treatment not only of streptococcal infections but of many infections associated with other Gram-positive pathogenic bacteria. At the same time chemotherapy may also be placed on a more rational basis.

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CHEMOTHERAPY IN ACUTE OTITIS MEDIA AND MASTOIDITIS*

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FOLLOWING the miraculous success of sulfanilamide in the treatment of streptococcic meningitis, chemotherapy was widely instituted in the treatment of all cases of otitic infections without due regard to the recognition of the causative organism.

The results for some time were not so impressive because little was known as to the dosage, the duration of medication and what factors should determine the continuation or discontinuation of the treatment.

During the past four years a great deal has been learned as to both the rationale of chemotherapy and its toxic effects. Although we are not altogether sure about the modus operandi of this group of drugs, nevertheless certain

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definite information has been obtained from many valuable observations.

In considering the use of sulfanilamide and its related drugs in infections of the ear and mastoid, it would seem in place to briefly consider the variations in the anatomy of the mastoid bone. Dependent upon the degree of pneumatization which has taken place, we may find the large pneumatic-celled type, the small celled type or the sclerotic type, the last of which may contain few if any cells. Any infection of the middle ear or mastoid is, therefore, greatly influenced by the structure of the bone. In the large celled variety, as stated by Williams in a recent paper not yet published, the infection travels along the mucosa of the cells and causes this mucosa to secrete so much fluid into the cells that pressure necrosis of the bony trabeculæ results. In the small celled or sclerotic type, because of the greater thickness of the submucosal tissue and its tremendous vascularization, the disease spreads by phlebitis of the veins.

The infection in the middle ear comes either by way of the lumen of the eustachian tube or along the submucosal lymphatics of the tube. For the most part it is generally agreed that the eustachian tube is the canal through which the infection travels from the nasopharynx to the middle ear.

According to Lillie's classification we have two definite clinical pathological types, the osteothrombophlebitic type and the suppurative coalescent type. In the first type, the infection spreads by infective thrombophlebitis of the small vessels of the mastoid bone and in this variety the symptoms of sepsis are apt to appear early in the disease. In the suppurative coalescent mastoiditis the infection spreads along the lining of the cells and due to pressure, necrosis of the mucous membrane and of the bony trabeculæ takes place. This type occurs for the most part in the large pneumatic mastoid and complications are less frequent than in the thrombophlebitic type.

In reviewing the literature on the effect of chemotherapy in the treatment of infections of the ear and mastoid, one can find just about the kind of a report he desires.

Lyons at the Massachusetts Eye and Ear Infirmary has shown that sulfanilamide weakens the virulence of the hemolytic streptococci and that the organisms regain their virulence on the withdrawal of the drug. His work has also shown the advantage of antibacterial antibodies when used as adjuncts to sulfanilamide therapy.

In a series of 200 cases reported at the above institution Converse found the Streptococcus hemolyticus present in eighty-three cases and in only nine instances did mastoiditis develop. Four cases are reported in which there was a recurrence of the otitis media on the withdrawal of the drug and in three other cases there was a late occurrence of meningitis in patients treated with small doses of sulfanilamide after mastoidectomy. These cases, according to the author, demonstrate that sulfanilamide therapy once instituted for good and sufficient reason should be continued until there is absolute subsidence of the infection.

On the other hand Hebble at the Children's Hospital in Philadelphia reports seventeen cases of otitis media with some clinical signs of mastoiditis where the infecting organism was the Streptococcus hemolyticus. Four patients recovered on medical treatment whereas on the other thirteen a complete mastoidectomy was performed.

In analyzing these cases there are several possible reasons for the possible failure of chemotherapy. In the first place, the initial dosage was insufficient and the therapy was discontinued too early in many instances and again some of the patients had a surgical involvement when chemotherapy was instituted.

At the University of Chicago clinics during the last three or four years the number of operations for mastoiditis has decreased markedly and this is definitely in keeping with our own observations. Lindsay in November reported ten cases of complications of otitic origin such as meningitis, abscess under the dura and petrositis. His conclusions or deductions were that chemotherapy is most successful in treating a complication which has spread by vascular routes. This corresponds to our own experiences and has been expressed by a number of authors such as Lillie, Williams and others.

Authors such as Long and Bliss feel that mastoiditis caused by the Streptococcus hemolyticus or the pneumococcus can be controlled by chemotherapy and some have gone so far as to say that surgical mastoiditis can be cured by sulfanilamide and allied preparations.

Goodyear, along with others, on the other hand, feel that otitis media due to the Streptococcus hemolyticus, when treated with sulfanilamide, will show a favorable response within four days and, if not obtained in such a time, the drug should be discontinued to avoid its masking effects.

Kopetsky claims that chemotherapy does not have the same effect on organisms located in active bony lesions.

Fenton feels that sulfanilamide may mask the clinical evidence of active infection in the mastoid until serious complications have taken place. In support of this observation we can report two cases, one of meningitis and the other of sinus thrombosis, both of which were treated for weeks with sulfanilamide and considered to be progressing nicely toward recovery.

In a series of 100 cases of scarlet fever treated by Sako, Dwan and Platou with sulfanilamide, only eight developed complications, five of which were otitis media. In 100 cases not treated with this drug, the authors found forty-one complications and seventeen of these were otitis media with four cases of mastoiditis. It does seem from this good piece of work and similar observations by a few other authors that sulfanilamide given for Streptococcus hemolyticus infections prevents, to a great extent, the development of otitis media and subsequent mastoiditis.

Williams reports a series of 265 patients with acute otitis media, 112 of whom received sulfanilamide therapy and 153 did not. Of the 112 patients, the Streptococcus hemolyticus was the offending organism in sixty, the penumococcus in sixteen and no organism was identified in thirty-six. In the 153 patients not treated, the Streptococcus hemolyticus was found in thirty-four, the pneumococcus in fifteen and no organism in 104. He concluded that there was 14.5 per cent less surgical mastoiditis in the group receiving sulfanilamide therapy over those not treated with chemotherapy and he felt that more definite protection was obtained in the group in which the causative organism belonged to the pneumococcus family.

Over a period of several years we have had a series of sixty patients with otitis media, forty of whom received chemotherapy and twenty of whom received none. Of the forty treated, nineteen showed the Streptococcus hemolyticus, five the pneumococcus and in the remaining sixteen there was no definite organism recovered. These were given large initial doses and the therapy was continued for a week after the subsidence of symptoms such as temperature, tenderness, leukocytosis, pain and edema. In the streptococcus group we did three mastoidectomies and in the pneumococcus group one operation. The group showing no organism contributed two mastoid operations.

In the untreated group of twenty cases the streptococcus was recovered in nine cases, the pneumococcus in three cases and the remaining eight cases showed no growth. In this group we had five operations, three where the streptococcus was the causative agent, one each for the pneumococcus and the no-organism groups.

In this short series, which is small compared to those made at large centers and charity hospitals, the figures show a 10 per cent statistical advantage in favor of chemotherapy.

There should be a definite procedure followed in treating a patient with purulent otitis media. At the time of the myringotomy the material obtained should be cultured and, if a Streptococcus hemolyticus or a pneumococcus is obtained, chemotherapy is definitely indicated. The patient should be hospitalized where he can be observed closely and where routine laboratory work, such as white counts, urinalyses and hemoglobins, can be done. There is sufficient evidence to indicate that chemotherapy can shorten the course of the disease and in a good number of cases prevent complications. A large initial dose of twenty-five to thirty grains should be given and then fifteen grains every four hours for three or four days. If the temperature drops and the discharge diminishes, the dosage can be cut to forty or fifty grains a day for a few days and then to twenty grains a day for a few days. It is necessary to continue the sulfanilamide for six or seven days after the subsidence of symptoms to avoid a recurrence of the infection. In pneumococcus cases smaller doses of sulfathiazol are given.

In children who are acutely ill it is our custom to give two grains of sulfathiazole per pound to be followed by a maintenance dose of one grain per pound. If the desired results are not obtained, the level of the drug in the blood should be checked, because some patients do not get

optimal level on this dosage. When sulfanilamide is indicated, one-fourth gram per kilogram body weight is given the first twenty-four hours to be followed by one-tenth gram per kilogram body weight as a maintenance dose. Along with the chemotherapy antibacterial serums are often a valuable addition.

Conclusions

Chemotheropy should be used in the treatment of otitis media and mastoiditis, but not in a haphazard manner.

It should be given after a culture has been made from the material obtained at myringotomy, in large initial doses and continued in a dosage which will maintain, if necessary, the blood level at ten to fifteen milligrams per one hundred cubic centimeters for sulfanilamide and six to eight milligrams per one hundred cubic centimeters for sulfathiazole.

The drug should not be discontinued until there is an absolute subsidence of symptoms.

Routine laboratory work should be done to detect any evidence of toxicity.

Diligent observation should be maintained to avoid optimism caused by the masking of symptoms.

Definite evidence of suppuration in the mastoid requires first the exenteration of the cells and then chemotherapy.

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OUR AGING POPULATION*

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DURING the past ten years the population of the United States has changed markedly. We are becoming a middle-aged and old-aged nation.

Many articles have been published both in lay and scientific journals reviewing this change. It is expected that this trend will continue into the future. These changes in age structure will modify the lives of the American people in many ways, socially and economically. The field of medicine will be especially affected because the type of sickness prevalent in a community, is greatly influenced by the age composition of the population.

In the past the combination of high birth rates and immigration of young people resulted in a population characterized by many young adults and a small proportion of older persons. Since the beginning of the century, the birth rate has dropped more than one-third, and there is practically no immigration. No change in birth rate can affect this trend toward advancing age in less than twenty or thirty years. If we consider sixty-five as the threshold of the old age group, 4.1 per cent of the population constituted this group. With the last census, 1940, 6.8 per cent belong to this age group. It is estimated that this number will be 14 per cent by 1980 with a total number of approximately twenty-two million over the age of sixty-five.

This condition has been brought to the public notice when the results of the 1940 census were published. This paper will be in the nature of a review of some of these articles.

The census proved what was suspected, that a lower birth rate and better medical care of infants and young adults resulted in saving a great number who reached middle age and beyond. The census figures bring out the fact that persons sixty-five years of age and over now number

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8,956,000 or 6.8 per cent of our total population; an increase of 35 per cent over the number in this age group in 1930.[1]

TABLE I. EXPECTATION OF LIFE AT BIRTH
Industrial Department, 1911 to 1940
Metropolitan Life Insurance Company

Calendar Year	Expectation in Years	Calendar Year	Expectation in Years
1940	62.93	1930	57.36
1939	62.50	1929	55.78
1938	61.94	1928	55.88
1937	60.71	1927	56.42
1936	60.31	1926	55.02
1935	60.25	1925	55.51
1934	59.45	1924	55.62
1933	59.19	1919–1920	51.14
1932	58.80	1911–1912	46.63
1931	57.90		

Gain, 1940 since 1911-1912, 16.30 years

These changes will affect our economy, our institutions, and especially the field of medicine. We must plan our medical resources in the light of trends which are unalterably upon us. In Caesar's Rome the average expectancy was twenty-five years; after our American Revolution thirty to thirty-five years; by 1900, the figure was fifty years. Today, the expectancy is nearly sixty-three years. I might add that the increase has been in middle years; that there has been no increase in longevity and the person seventy years today may not have quite as good a chance to live to over eighty, as did one of seventy years in Lincoln's time. If present tendencies continue, the population of this country will become stationary with a high percentage of people past middle-age. Unless a marked change in present tendencies occurs by 1950, the percentage of persons over sixty-four will equal the number of children under five years (7.9 per cent). By 1980, birth rate and death rate may be equal at about thirteen per thousand.

When compared to the rest of the world the United States ranks high in expectation of life at birth. In recent comparable periods, expectancy of life here has been greater than in Belgium by about three years; England and Wales by a little over one-half year; France by four and two-thirds years; Germany by over one year; Italy by almost six and a half years. Switzerland and the Union of South Africa had about the same life expectancy as the United States. On the other hand, the Scandinavian countries, New Zealand and Australia, still rank above the United States in average length of life. Although these countries make better showings as a whole, several of our states compare favorably with them. These are the central states with Minnesota in very high brackets, 65.22 years.[6]

TABLE II. PER CENT OF DISTRIBUTION OF TOTAL POPULATION BY AGE
UNITED STATES
1850 to 1950
From chart by Louis I. Dublin, Ph.D.
Metropolitan Life Insurance Company

Age	1850	1870	1890	1910	1920	1930	1940	1950
65 and over	2.6	3.0	3.9	4.3	4.7	5.4	6.3	7.9
45 – 64	9.8	11.9	13.1	14.6	16.1	17.5	20.2	21.4
20 – 44	35.1	35.4	36.9	39.1	38.4	38.3	38.8	39.7
5 – 19	37.4	35.4	33.9	30.4	29.8	29.5	26.4	23.1
Under 5 yrs.	15.1	14.3	12.7	11.6	11.0	9.5	8.3	7.9

1850 to 1930 from U. S. census data.
1940 to 1950 estimated by Thompson and Whelpton.
The percentage for age sixty-five and over has been found to be 6.8 per cent, 1940 census.

Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, has made an extensive analysis of this problem.[5] He has pointed out that the proportion of elderly people in our population will increase threefold in the next fifty years if present trends continue. There will continue to be a drop in the age group below twenty years. The number of persons per one hundred of population who are in the earning and producing group of twenty to sixty-four years will stay at about the same—about fifty-six; but the ratio of the aged to the workers will change from the present six to fifty-six, upward to seventeen to fifty-six in 1980. From the economic side, an increase in pensionnaires will mean an increase in taxes. As to the present rates of Social Security taxes, let us remember what happened to the fraternal insurance companies of the last generation; rates were low after organization, low death rate, rush of new members. The companies became older, death rates increased, assessments had to be raised.

TABLE III. SOCIAL SECURITY, BUREAU LABOR STATISTICS

Means of Support of Persons Sixty-five Years of Age and Over in the United States, Compiled and Estimated, April, 1937.[2]

Economic Status	Number	Percentage Distribution
Estimated number of persons 65 and over in the United States, Jan. 1, 1937	7,816,000	100.0
Self-dependent	2,746,000	35.1
By reason of		
Current earnings	1,000,000	12.8
Savings, real estate, securities	1,172,000	15.0
Federal Pensions	104,000	1.4
State Pensions	24,000	0.3
Municipal Pensions	42,000	0.5
Private Industrial Pensions	150,000	1.9
Insurance Annuities	204,000	2.6
Other Sources	50,000	0.6
Dependent	5,070,000	64.9
Under Social Security Act, Dec., 1936	1,116,000	14.3
Emergency Unemployment Relief, Poor Relief, Old Age Assistance.	268,000	3.5
In Public Homes	67,000	0.8
Other Agencies	139,000	1.7
Dependent on Friends and Relatives	3,480,000	44.6

The Social Security Act apparently planned on a fund of 47 billion dollars by 1980. With present population trends there will be a need of near 60 billion dollars. There is reason to doubt that such a fund will ever be accumulated. The tax proceeds from this act should amount to one billion dollars a year, but the Treasury is allowed to turn this amount into an attempt to balance the Federal Budget, issuing United States bonds or buying old bonds. It is here that this act parts company with the established insurance practice. The insurance company uses its funds to buy tangible assets, from bonds of corporations to farm loans, all with earning power. The monies paid into the old age fund will have no earning power, and must become a financial strain on any government. There will be some limit to the ability of the producing classes to pay taxes, then.

Almost 65 per cent of the 8,000,000 persons in the United States who were sixty-five years or over at the beginning of 1937, were dependent. This was the conclusion reached in a study recently made by the Social Security Board, published in the March, 1938, issue of the *Social Security Bulletin.*[2]

A marked change in attitude is noted in the relatives of these old people in regard to helping them. Formerly, it was taken for granted that members of their families would assume charge of them and the public was not asked to assume the burden of their care. With new legislation and easier charity from the government there is a growing tendency for sons and daughters to avoid care or housing of indigent parents. This brings many of them into our smaller hospitals, individuals who could often be cared for at home with little effort. Such effort is not made, and a demand is made that the public assume the full burden.

It is noted that as of April, 1937, 12.8 per cent or 1,000,000 of these old people lived on current earnings. The condition of unemployment recently showed improvement with young men being called into the army. Because of the absorption of young men into the army and a greatly increased manufacturing industry, a demand is being created for older workers. May 4, 1941, was designated by the President as National Employment Sunday and the week following as National Employment week, in a proclamation of April 3, 1941. This proclamation pointed out that numerous older workers with excellent abilities and skills are still unemployed. It was also pointed out that many of these middle-aged unemployed possessed special skills which are valuable in a defense program.

Fifteen per cent of these old people of sixty-five years and over, numbering 1,172,000 as of April, 1937, are classed as self-dependent by reason of savings; these being savings accounts, real estate or securities. With present tax increases these self-dependent people will suffer loss of income. This will be more of a burden because of increased cost of living and may force some of them into the dependent group.

You will note that a considerable number of these old age groups are independent because of pensions from Veterans' Administration, Federal Employees, and Civil Service. These people are classed as self-dependent because during a period of years they have worked with the object in view of having this protection for their old age. The same may be said to be true of the state and municipal pensions. It will be expected that veterans' pensions will increase markedly in the future. Private industrial pensions were taking care of 150,000 of these old age persons

as of 1937. Some 204,000 of this group were self-dependent because of annuities. If annuities are not taxed out of existence they will continue to be a source of income for this age group.

Of the dependent groups over a million persons were receiving public assistance under the Social Security Act. This was as of December, 1936. Of course the number has increased since that time. Some 200,000 were under emergency employment, relief, old age assistance, poor relief, or other. Private homes run by denominational, fraternal and other organizations take care of many; hospitals for mental diseases 72,000. It will be noted that 3,480,000 were dependent on friends or relatives, wholly or almost wholly. This is quite as it should be and as it was in the past generation. Many of these old folks have worked and spent their money to educate and otherwise prepare their sons and daughters for life; the sons and daughters in return are paying them back and afford them protection. This, however, will become more difficult under our present mode of life; small homes, apartments and limited room.

Dr. Carl D. Camp, Ann Arbor, has urged a more careful evaluation of the medical problems of old age. While the study of infancy and its diseases has given rise to the specialty of pediatrics, the study of the involution period seems to have been neglected. An intensive study should be made of the needs of this period, diseases peculiar to the period and the modification of symptoms and course of other diseases. One cannot set a chronologic age period, for individuals differ. Between sixty and seventy most men are confronted with the problem of a possible change in their manner of life. The question of retirement, change of occupation or modification of one's work must be decided for each individual. It is at this period that the individual who has an avocation is fortunate. The man who stays on too long is not adjusting himself to his best advantage. If he feels compelled to go on in his work or profession, some modification of such work should be planned.[3] I shall not try to discuss the value to society of the physicians, lawyers and scientists who go on and do excellent work to and beyond eighty years. As a general rule one would like the man over sixty-five years to continue his occupation or interest, modified only to the extent of lessened responsibility and more fixed routine.

As a result of the increase in numbers of this group, geriatrics should approach pediatrics in importance. Studies of the aging process should be made and an effort made to improve the comfort of these old people. Cardiovascular diseases will make up an increasingly large part of the medical clientele in the future. Cancer is a problem of growing importance and while cancer rates will remain about the same, there will be growing numbers of cancer patients because of the increase of older persons in the population. There is the possibility that tuberculosis hospitals, when no longer needed for that purpose, may be used to take care of a part of the load of cancer and other chronic diseases. Respiratory diseases continue to take large numbers, but the mortality from pneumonia has dropped appreciably in recent years due to new treatment. It may be noted that modern therapy for pneumonia is not so efficient in the old as in the young.

Morbidity statistics are affected by the large increase in this group. Old age is characterized not only by a high mortality but by a high rate of disabling sickness. Acute illnesses of short duration predominate in the younger ages; in old age these are secondary in importance to chronic diseases with disability of months or years. The number of invalids per thousand increases rapidly with the years. While the average rate was eleven per thousand for all ages, the number of invalids per thousand between the ages of sixty-five and seventy-four was 53.5.

Mental diseases will be an increasing problem. Senile psychosis, cerebral arteriosclerosis, and similar conditions will overtax existing institutions.

In Crookston we have two hospitals, Bethesda Hospital and St. Vincent Hospital, with a combined capacity of just over 100 beds. On June 1, 1941, there were in these hospitals thirty patients of sixty-five years of age or over. During the month there were 203 patients admitted to these institutions of whom thirty-one were over sixty-five years. At the present time in these hospitals there are the usual run of paralytics from cerebral accidents, progressive cancer cases, senile dementia from cerebral arteriosclerosis and others with chronic arthritis and such conditions. The hospitals have found these cases a problem. During the past years in these hospitals it was noted that there was an increase in the number of admissions of older patients.

The problem is especially hard when the patient is physically disabled and mentally normal. It is not enough to just keep these individuals alive, to feed them and keep them clean. Some provision should be made for physical therapy through work, some entertainment—something to make them look beyond themselves. Being a bed-ridden or wheel chair patient will hurry on the senile changes and soon we have a depressive mental condition.

An article in *Harper's Magazine* for October, 1939, by Roy Helton, is a good example of a review of this subject in a popular lay magazine. He advocates that the aging should attempt to devise for themselves occupations at which they will also create wealth of things or services. He feels that after an individual retires and steps out of the active scenes of life, he is likely to quickly show the debilitating effects of old age. "Sudden loss of the sustaining habits and motives that have kept him in active competition for the rewards of labor, can within six months transform the busy lawyer, physician, or merchant into an aged hypochondriac." We have seen numerous examples which prove the above statement and in a rural community such as ours, I have seen many farmers and small businessmen go through this degenerating process after retiring from active life without any activity, mental or physical, to take up their time.

As preventive medicine succeeds, non-preventable diseases increase in relative importance. It would seem that preventive medicine in the younger groups has resulted in there being more sub-par older people subject to the degenerative diseases which are non-preventable. Thus, while there are more older people in the population, there appears to be no percentage increase of very old people. In other words, longevity is about what it was.[4]

An interesting phase of this problem is the increasing number of older patients who must be received as surgical cases. Many writers have expressed their interest in this problem in recent years. The urologists, of necessity, were the first to realize the ability of the aged to withstand surgery with surprising resistance General surgeons took on strangulated hernias and other emergencies. Gradually, experience has shown that old age is not the contra-indication that it was forty years ago. Reports of major operations successfully carried out in the aged are accumulating. Rankin and Johnson have reported an extensive experience in the surgical care of the aged. They emphasize prolonged and careful pre-operative care where possible, a careful examination, short period of recumbency, careful postoperative care, bodily warmth, fluids, frequent change of position and inhalations of carbon dioxid-oxygen. Respiratory complications are the most common.[7]

Without thinking about it we have continued to make plans to meet the demands of an increasing population. We have taken it for granted that we will need larger factories, farms and especially schools. Already primary schools show a falling off in attendance. This aging of our population has been appraised as the most important cultural and sociological change since the Renaissance. The change has come with startling rapidity during the present and immediately past generation. It will be more of a test to our social, political and economic institutions than was the arrival of the machine age.

Ours will be an age-conscious society in the future. This group will become better organized than the present "Dr. Townsend and Thirty dollars every Thursday" groups. They will be consumer groups rather than producers, and they will not be different from other pressure groups but will vote as a class for the clever politician who may dangle greater favors before them.

It would seem that the medical profession is facing a problem of great magnitude in the immediate future. Special study should be given to the process of aging. The effort should be made to make the lives of these old persons more pleasant and comfortable. We should give some heed to the problem of how this should be done. Do we wish to have the government take over the entire care of these old people, feeding them and giving them shelter in some sort of institution and giving them needed medical care? If not this, who will pay for their care? Is present care sufficient?

In New York City a chronic disease center has been established at Welfare Island. Here will be included a research division which will study the onset and treatment of the chronic diseases of old age. From these studies we may eventually learn what conditions are preventable or postponable. Good medical care for the aged

will require the services of a large and increasing number of physicians. The question before us will be whether these will be under Federal or State control with salaried physicians in charge.

The problem is one which the profession should consider seriously and some plan should be formulated by the profession to add to this needed care.[5] If we do not assume some leadership in this matter other social agencies will take over the care of this group.

The problem before us for the next few years will be that of a group in the productive age confronted with the problem of an extended educational period for our youth. It has been found that as a rule this period of training is from one to four years longer than was true in the past. On the other side we are having a higher percentage of old persons in the communities who will be more or less unable to care for themselves. The taxpayer meanwhile stands between the two groups, and taxpayer means all of us in one way or the other. This producer group is being asked to contribute more and more for education and more and more for the social security and old age pensions.[8]

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CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

Frank C. Andrus, Pathologist

CHRONIC ARTHRITIS

Presentation of a Case

The case is that of a man fifty-seven years of age at the time of death who was first seen in February, 1928, when he complained of deformities of the joints of the fingers, wrists, and toes which had developed during the preceding two years. These had been accompanied by attacks of swelling, pain, local heat, and tenderness in the various joints affected. The attacks would last for a few days and then the symptoms would disappear. Finally, the patient noted that his wrist and fingers were becoming stiff and deformed. The patient's toes were so painful that he was unable to walk about. Past history at that time revealed that he had pyorrhea and dental caries for many years. He denied venereal disease.

Physical examination revealed the heart rate to be regular and no murmurs were heard. The blood pressure was 120/76. Examination of the abdomen was negative. There were marked flexion deformities of both hands and feet with some ankylosis of the joints. A diagnosis of osteo-arthritis deformans was made at that time. He was given salicylates and transferred to a rest home for four years. The patient's course there was uneventful. At no time did he have any fever. Examination of the urine revealed no abnormalities. The hemoglobin was 90 per cent.

The patient was then not seen until August, 1933, when he was again admitted for the same complaints. He now had pain and rather marked deformity in most of the joints of his body. The joints were swollen and the patient had marked interference with motion. Physical examination showed no additional findings except the marked deforming arthritis. The eyes were negative. The blood pressure was 140/90. The patient was bedridden. He was kept at the rest home for nursing care. During September, 1941, the intern noticed some peculiar lesions in the patient's eyes. In both scleræ there were a number of oval and rounded defects which were dark in color. These defects protruded as herniations from the surface of the scleræ and only a thin membrane appeared to be present over the choroid which protruded outward. The ophthalmologist made a diagnosis of scleromalacia perforans. The patient was transferred back into the hospital for study of the eye condition, where he developed an irregular fever and expired in October, 1941. Several laboratory examinations showed no abnormality in the urine. The hemoglobin was 90 per cent in 1933, 80 per cent in 1934, and 50 per cent in 1937. No other laboratory work was done.

Clinical Diagnosis: (1) Chronic rheumatoid arthritis; (2) Scleromalacia perforans; (3) Bronchopneumonia.

Autopsy Findings: The body was that of a poorly developed and emaciated man weighing about 100 pounds.

There were marked flexion contracture deformities of the hands, fingers, wrists, knees, and hips. There was edema of the feet and ankles. Cyanosis of the fingertips and mucous membranes was seen. There was no jaundice but there was a brownish discoloration of the skin of the entire body. Crusted ulcerations were seen over the upper legs and knees. There was a large decubital ulcer. The peritoneum appeared normal. The liver did not extend below the costal margin. The pericardium was adherent to the heart and the sac was obliterated. The pericardium could be stripped from the heart with difficulty. It was not adherent to the surrounding structures.

The heart weighed 350 grams and the left ventricular muscle appeared to be slightly thickened. There was thickening of some of the chorda tendinæ and of one of the leaflets of the mitral valve. The heart was otherwise normal.

The lungs were both about twice as heavy as normal. There was consolidation in the posterior portions and pus could be expressed from the bronchi.

The spleen weighed 1,475 grams (about ten times normal). It was rather firm. There were a number of calcified small nodules on the cut surface varying in size up to 4 mm. The liver was of normal weight and showed the fine type of cirrhosis.

The lymph nodes were enlarged, all of the regional nodes being affected. They appeared hyperplastic.

Anatomic Diagnosis: (1) Chronic rheumatoid arthritis; (2) Adhesive pericarditis (rheumatic); (3) Rheumatic mitral valvulitis (old); (4) Scleromalacia perforans; (5) Generalized lymphadenopathy; (6) Portal cirrhosis; (7) Felty's syndrome.

Discussion

Dr. Frank Andrus: In addition to the chronic deforming arthritis, this patient displayed several anatomic findings of interest. In the first place, he had what has come to be known as Felty's syndrome, a combination of chronic arthritis, splenomegaly, secondary anemia, generalized lymphadenopathy, and in addition, a peculiar disease of the scleræ which has been recognized to be associated with chronic arthritis. The patient had one other finding of interest and that is the evidence of old rheumatic heart disease. I am going to ask Dr. Fingerman to discuss Felty's syndrome and the relation between chronic arthritis and rheumatic heart disease.

Dr. David Fingerman: This syndrome was described by Felty in 1924. He collected 5 cases which were strikingly similar in that they all had arthritis, splenomegaly, and leukopenia. In three there was also brownish pigmentation of the skin and lymphadenopathy.

In addition, our case had a rare eye condition known as scleromalacia perforans. This consists of the appearance of holes in the scleræ which may coalesce so that large gaps develop where the uvea lies covered only by the conjunctiva or is bare. The process is considered to be a degenerative change of the scleræ. Several reports have appeared in which this condition has been noted to be associated with chronic arthritis.

Two cases of Felty's syndrome have been described in which Streptococcus viridens was isolated from blood cultures. Others have been described in which glomerulonephritis accompanied the other findings. In still others, Aschoff nodules have been found in the myocardium. In February of this year, Baggenstoss and Rosenberg studied twenty-five fatal cases of chronic infectious arthritis. All had progressive polyarticular inflammation. Twenty of these patients had associated cardiac damage, and lesions that were indistinguishable from those produced by rheumatic fever were found in fourteen. A normal heart was seen in only five cases. In ten of the fourteen patients in which there were rheumatic lesions, there was histologic evidence that the process was progressive and active at the time of death. The lesions in these consisted of valvulitis, pericarditis, and myocarditis of the diffuse and nodular types and typical Aschoff bodies were seen in some instances. In addition, more chronic changes such as thickening, hyalinization, and vascularization of the leaflets were found. In four there were no signs of activity. The valves were thickened and hyalinized and the process was interpreted as being "burned out." The heart disease was considered to be of importance in cause of death of seven of the fourteen.

These authors believe that the high incidence of rheumatic cardiac lesions in their series suggests a relationship between chronic infectious arthritis and rheumatic fever. They feel that the cardiac lesions associated with chronic infectious arthritis are not quite as severe or widespread as those lesions in hearts of young persons who have rheumatic fever; however, the differences are of degree, not of kind.

In the Minneapolis General Hospital since 1932, twenty-five cases of rheumatoid arthritis have come to necropsy including the case described above. Eleven of them had heart lesions and eight had evidence of rheumatic heart disease. Seven had mitral valve involvement and three of these also had pericarditis; two had aortic valvulitis. One had aortic valvular disease alone. Three patients had coronary sclerosis and myocardial fibrosis. In this series six patients had spleens which weighed over 300 grams, four had leukopenia, and three had the combination of lesions as described by Felty.

Dr. B. J. Clawson: This is another group in a series showing the relation between rheumatic fever and chronic arthritis. Wetherby has collected quite a number of cases in which there was heart involvement with chronic arthritis. The incidence of demonstrable heart lesions in living patients did not seem to be as high as that in acute rheumatic fever. There, I think, the age enters in. You do not usually get marked acute rheumatic involvement in later life. Those who have acute rheumatic heart disease died from it or from the resultant valvular deformity.

Dr. George Fahr: From these two series it would appear that permanent heart involvement is probably more common in cases of chronic rheumatoid arthritis than in acute rheumatic fever.

Dr. Andrus: The syndrome described by Felty probably corresponds in the adult to the Still's disease seen in children. I think that it might be regarded more as evidence of a chronic low grade sepsis rather than as a specific disease entity. If we recall the case considered today, we note that this patient, and some of the others described, had splenomegaly, portal cirrhosis, secondary anemia, and leukopenia; and the microscopic change in the spleen in this case is indistinguishable from that which we loosely classify as Banti's disease, so it might be equally justifiable to suggest that Banti's disease may accompany chronic arthritis.

There is perhaps no more neglected group of patients than those having chronic arthritis. I would like particularly to emphasize here that in this disease, even though the joints usually present the most obvious disturbance to both the patient and the physician, it must be regarded as a generalized body disease in which many tissues and organs are affected and undergo profound disturbances in structure and function.

HOMEOPATHIC AND ECLECTIC MEDICINE IN MINNESOTA

By James Eckman

Rochester, Minnesota

(Concluded from November issue)

Certain Homeopathic and Eclectic Pioneers

Dr. Julian F. DuBois,[138] secretary of the Minnesota State Board of Medical Examiners in Saint Paul, kindly furnished the author with data concerning the life and career of **Dr. Daniel Hough Roberts** (1824-1910), mentioned earlier in this paper. Mrs. J. L. Andrew of Los Angeles, California, reported to Dr. DuBois that her father, Dr. D. H. Roberts, was born in Wayne County, Indiana, on November 10, 1824. His father and mother were Quakers. Since there was no school in Wayne County during young Roberts' boyhood days, his mother taught him as best she could. Later a school was established. "The school was only three months during the winter," Mrs. Andrew wrote, "and while he plowed the field in summer he had his book in the rail fence corner and would digest a part as he plowed a furrow around the field."[138] At the age of sixteen years young Roberts entered the high school at Richmond, Indiana, and at the end of his courses was admitted to an advanced Quaker college. He then went to the Farmer's Institute at Fountain City, Indiana, but he was soon called to the chair of natural sciences at Whitewater College in Lafayette, Indiana. At length he began the study of medicine under a homeopathic physician, and became that physician's assistant. He was not graduated from a medical college. When it appeared to him that the climate of Minnesota might improve his son's health, he settled in the state. In October, 1871, he helped to found the Southern Minnesota Homœopathic Medical Society at Owatonna, and on May 14, 1872, at Rochester, he was elected vice president and treasurer of this organization.[6] He became second vice president of the Minnesota State Homœopathic Institute in 1875, first vice president in 1876, and president in 1877. He apparently was licensed to practice medicine in Minnesota by exemption.[83] Dr. Roberts went to California in 1896 for the sake of his wife's health, and at her death returned to practice in Owatonna. He later removed to California again, and died at National City on January 5, 1910, and was buried at San Diego.[138]

This chronicle may well end with the history of the careers of three Minnesota homeopathic practitioners who, although they were not essentially pioneers in homeopathic medicine, nevertheless occupied positions of such importance in the days when the homeopathic system was powerful in the state that some attention to their lives seems justified. The first of these was Dr. Henry C. Leonard. The second was Dr. William Edwin Leonard. The third was Dr. Henry C. Aldrich.

The first homeopathic practitioner to settle in Henderson was, according to Neill,[139] **Dr. Henry C. Leonard** (1849-1925). Dr. Leonard was born in the state of Virginia in 1849, but emigrated to Fillmore County in Minnesota with his parents while he was still a boy. In 1886 Dr. James G. Harper[140] wrote in the *Archives of Dentistry* of Saint Louis:

> Dr. H. C. Leonard, of Fergus Falls . . . was a fellow student of ours at the Minnesota State University. He was one of the many young men who supported themselves while attending the University; he carried a morning paper, up at 3 o'clock in the morning in that cold climate, where at times the thermometer ranged from 30° to 40° below zero.

It would appear that young Leonard's efforts at the university became too arduous for the good of his health, for it has been said that at one time while he was an undergraduate he suffered severely from eyestrain. His dogged stamina is evidenced by the fact that he walked all the way from Minneapolis to Saint Louis to be treated, returned to the university, and finished his studies. He was graduated in 1875 with the first degree of Bachelor of Civil Engineering ever granted by the University of Minnesota. Apparently, however, he had decided to become a physician, rather than an engineer, for in 1876 he was enrolled as a student at the Hahnemann Medical College and Hospital of Philadelphia. His preceptor had been the venerable William Huntington Leonard (1825-1907), and at the Philadelphia college he was a fellow student of Leonard's son, William Edwin Leonard (1855-1935).

Dr. H. C. Leonard was graduated from the Hahnemann school in March, 1878. He returned to Minnesota at once, becoming an instructor in botany at the University of Minnesota, where in 1879 he was granted the degree of Bachelor of Science. He then practiced medicine for a few months in Saint Paul, after which he settled in Henderson. In 1880 he moved to Fergus Falls, where he remained for many years.

Dr. Leonard was elected second vice president of the Minnesota State Homœopathic Institute in 1882, and in 1886 he was elevated to the presidency of that body. He also served as one of the collaborators of the old *Minnesota Medical Monthly,* second homeopathic journal to be founded in the state. He was licensed to practice medicine on December 31, 1883, by the Minnesota State Board of Medical Examiners,[141] and in 1887 Governor A. R. McGill (1840-1905) appointed him to membership on that board. He was the first professor (1888) of obstetrics in the University of Minnesota College of Homœopathic Medicine and Surgery, a position he resigned in 1891. DuBois[141] has reported that by 1903 he was in Battle Lake. At some time prior to 1905 he forsook the practice of medicine for the importunities of the farm near a place called Pine Knoll, but in 1905 he went to Duluth and resumed practice, opening his office at 416 Providence Building. In 1907 he became a member of the American Institute of Homœopathy. DuBois[141] wrote that in 1909 he was in practice at Aitkin. Dr. Leonard moved to California in 1915, and died at Santa Ana, California, in December, 1925. Two children survived him: Mrs. Joseph Marshall and Mr. Frank Leonard, Santa Ana, California.[142]

Dr. William Edwin Leonard (1855-1935), son of Dr. William Huntington Leonard, was born in Minneapolis on July 27, 1855.[36] He attended the public schools of Minneapolis and finished his preliminary education in the old preparatory school of the University of Minnesota. He was a member of the

fourth class (1876) to be graduated from the University of Minnesota, and was salutatorian of that class. He studied medicine for three years at the Hahnemann Medical College and Hospital of Philadelphia, from which he was graduated in March, 1879, with the degree of Doctor of Medicine. He spent an internship of one year at Ward's Island Homœopathic Hospital in New York City, and then returned to Minneapolis to practice medicine with his father. In 1907 he went to New York City once more, to enroll in a course at the New York Post-Graduate and Polyclinic Medical School and Hospital.

Dr. William Huntington Leonard was fifty-five years old when his son entered into practice with him in 1880. The two men were to work together for many years. Dr. W. E. Leonard had become a member of the Minnesota State Homœopathic Institute in 1879; in 1882 he became a member of the American Institute of Homœopathy. He was licensed to practice medicine in Minnesota in November of 1883, one month after his father had been licensed by virtue of the Medical Practice Act of 1883.[79] Father and son practiced together at the residence at 425 Second Avenue South in Minneapolis, which the elder man had acquired in about 1870. In 1887 they moved to an office in the Syndicate Building at 409 Nicollet Avenue.

The young man's progress in homeopathic circles in Minnesota was rapid. In 1883 he was elected treasurer of the Minnesota State Homœopathic Institute, and he was re-elected to that office in 1884 and 1885. In 1884 he was chosen secretary and treasurer of the Hahnemann Medical Society of Hennepin County, which his father had helped to found. For several years he was chairman of the all-important Bureau of Materia Medica of the state institute. In 1896 he was chairman of a committee which sought to raise funds in Minnesota for the erection of a monument to Christian Friedrich Samuel Hahnemann (1755-1843) in Washington, D. C. He was professor of materia medica and the institutes of medicine in the old Minnesota Homœopathic Medical College from the date of its foundation to the time of its merger with the University of Minnesota, and he was professor of materia medica and therapeutics in the University of Minnesota College of Homœopathic Medicine and Surgery from its formation in 1888 to its dissolution in 1908. He was editor-in-chief of the *Minnesota Medical Monthly,* second homeopathic journal to be founded in the state, throughout the two years of its existence. He served a total of twelve years (two terms) in the Minneapolis Department of Health, including a four-year tenure as senior medical inspector. In 1902 he wrote *The Healthy Woman,* a 152-page work which was issued by the Contemporary Publishing Company of New York. Dr. Leonard occupied several offices during his long career in Minneapolis, first at the family home, next in the old Syndicate Block at 409 Nicollet Avenue, next in the Andrus Building, and finally in the Donaldson Building, which for years was the headquarters of the Hennepin County Medical Society.

Dr. Leonard, one of the few earlier practitioners of homeopathy who were born in Minnesota, was keenly interested in all aspects of the history of the state. He was an active member of the Minnesota Historical Society, and at the dedication of the present building of the society in Saint Paul on May 11, 1920, he attended the ceremonies as one of the delegates from the Native Sons of Minnesota.[143]

He had been married, in 1881, to Miss Marian L. Marshall of New York

City. She died in 1905, leaving two daughters, Elsie Preston Leonard and Miriam L. Leonard. Dr. Leonard long survived his wife. The *Journal-Lancet,*[144] in October, 1929, announced: "Dr. William E. Leonard, who had practiced in Minneapolis for over fifty years, left the city last month, and went to Hadley, Mass." The aged physician, who had lived through the most salutory days of homeopathy in Minnesota, and who had remained steadfast to the tenets of homeopathy all his life, was to come back to Minneapolis to die. He died of arteriosclerosis and coronary thrombosis at 2404 Fremont Avenue South in Minneapolis on August 28, 1935, twenty-eight years after the death of his revered father.[79]

Dr. Henry C. Aldrich (1857-1922) was born to a resplendent tradition in the annals of pioneer history in Minnesota. His father was Cyrus Aldrich (1808-1871), a native of Rhode Island who had come to Minneapolis in 1855 to enter the lumber business. He served as a member of the state constitutional convention of 1857, was elected to the national House of Representatives in 1858 and 1862,[145] and was said to have been active in the establishment of the mighty Northern Pacific railway system.[36] The younger Aldrich was born in Minneapolis in 1857, and after completing his preliminary education apparently decided to become a dental surgeon. He was graduated in 1879 from the University of Pennsylvania with the degree of Doctor of Dental Surgery, but straightway enrolled in the Hahnemann Medical College and Hospital of Philadelphia. From this institution he obtained the degree of Doctor of Medicine in 1881.

Dr. Aldrich did not return to Minnesota to practice medicine. Instead, he settled in Iowa, and appears to have tired of his adopted state within a short time. In the *Minnesota Medical Monthly*[140] for October, 1886, the following announcement was published:

> FOR SALE—Practice of $2,500 in good town in Northern Iowa. Will sell house and practice for $600. Address H. C. Aldrich, M.D., Nashua, Iowa.

The same homeopathic journal observed in June, 1887: "Dr. Henry C. Aldrich, M.D., now of Nashua, Iowa, will locate in Minneapolis in August. He is now taking special instruction with certain of the Boston University† faculty."[146] Later (1896) Dr. Aldrich[147] wrote that when he was in practice in Iowa he had been a member of the Cedar Valley Homœopathic Medical Society. DuBois[79] has reported that Dr. Aldrich received a license to practice medicine in Minnesota on April 26, 1887. One year later Dr. Aldrich was admitted to membership in the American Institute of Homœopathy, with which he was to be prominently associated for the rest of his career.

Dr. Aldrich came to Minneapolis a little more than one year after the establishment of the *Minnesota Medical Monthly* and the Minnesota Homœopathic Medical College, and thus could not have taken part in the organization of these two ventures. In the summer of 1887, however, he became lecturer in pathology, histology and microscopy in the homeopathic college,[52] and in 1893 he was elected professor of diseases of the skin and venereal diseases in the University of Minnesota College of Homœopathic Medicine and Surgery, which had absorbed the Minnesota Homœopathic Medical College in 1888.[52] At the first meeting of the faculty at the University in 1893 Dr.

†The Boston University School of Medicine was organized in 1873 as a homeopathic medical college. For many years, however, it has been a "regular" institution.

Aldrich was elected clinical professor of diseases of women, a post which he resigned in January, 1894.[52]

In 1893 Dr. Aldrich was elected secretary and treasurer of the Hahnemann Medical Society of Hennepin County, and when it was decided that a homeopathic medical journal should be initiated to take the place of the foundered *Minnesota Medical Monthly,* Dr. Aldrich became editor-in-chief of the new organ. It was called the *Minneapolis Homœopathic Magazine,* and the first issue of it appeared in May, 1892. Dr. John Flanders Beaumont (1855-1927), Dr. David W. Horning (1852-1917), and Dr. Asa S. Wilcox (1859-1916) were associate editors. The publication was subsidized, as has been shown; it was published by the Minneapolis Pharmacy Company, at 604 Nicollet Avenue, "Successors to Boericke & Tafel," the great homeopathic pharmaceutical house of Philadelphia. G. A. Babendrier was business manager of the *Minneapolis Homœopathic Magazine.* While Dr. Aldrich was editor of this journal he maintained offices in the Syndicate Block at 409 Nicollet Avenue, and he lived at the Hotel St. Angelo, 1212 Nicollet Avenue. In 1905 his offices were situated at 313 Medical Block, and in 1908 they were situated at 401 Donaldson Building. For several years during the latter portion of his career he lived at 2431 Hennepin Avenue.

Dr. Aldrich persisted in his devotion to homeopathy long after it had become evident that the system of practice was fast dying out throughout the United States. DuBois[79] said that he served as president of the American Society of Orificial Surgeons, a subsidiary body of the American Institute of Homœopathy, and in 1908 he was elected president of the Obstetrical Society of the American Institute of Homœopathy.

The culmination of Dr. Aldrich's professional career was his elevation to the presidency of the American Institute of Homœopathy in June, 1915.[148] He was always a respected and even venerated speaker at sessions of the Minnesota State Homœopathic Institute, and as late as April, 1916, he was the speaker at a joint session of the homeopathic and eclectic medical associations of South Dakota at Sioux Falls.[149]

Dr. Aldrich died in Santa Monica, California, on September 28, 1922.[79] His wife and one son, Henry, survived him.

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*References 1-18 appear in the June issue, page 479; 19-37 in the July issue, page 572; 38-58 in the August issue, page 674; 59-81 in the September issue, page 769; 82-116 in the October issue, page 873; 117-137 in the November issue, page 967.

President's Letter

"THE YEAR ENDS"

SOMEONE has said that a man is not old until he lives in the past, thinks in terms of his younger years, and talks of the better ways of living when he was a boy. As his teen years begin to wane, he looks forward with enthusiasm to his life in the future. Ambition rules his ways and accomplishment regulates his days.

Similar are the thoughts of a man as he takes over the reins as president of the Minnesota State Medical Association. A full year is ahead, three hundred sixty-five days in which he hopes to complete much work and attain a goal which he sets for himself, and all of a sudden he is brought to the realization that his year has passed and then he makes an analysis of his accomplishments and all the days and nights of endeavor pass in review.

As he takes hold of the wheel at the beginning of the year and helps to drive the machine for a time, so he relinquishes it again to his successor when twelve months have passed. The basket of work which his predecessor passed to him is still full of pages to be reviewed and the torch of Minnesota medicine which he carried so proudly January first still burns only as brightly as when he first held it aloft.

The year 1941 has been one of unusual activity. Military and civilian forces have had their influence, but through it all our Association has kept its main endeavor in mind, "good health for all the people."

We are standing at the top of medical endeavor. No profession has such an influence in lay organizations as ours; our contacts with governmental groups are excellent; our legislative record is clean and within our own group only the best of feeling prevails.

Here and there a little rift has appeared at times but slight coöperative effort has stilled the troubled waters of discontent and minds have been set at ease.

Only the best of harmony is evident between the American Medical Association and ourselves. Sister State Medical Societies are friendly and the best of relations exist between their state offices and our own.

It has been my pleasure to appear before most of our county societies and to get better acquainted with our twenty-seven hundred members individually. Earnest and conscientious in their work, it is an honor to be associated in the same organization with them.

I want to thank each one for his active participation in committee work. In no mean way is the success of the organization your success.

To the incoming officers for 1942, and especially to Dr. Giffin, our incoming president, I wish every prosperity during their tenure in office. I know that the year will be filled with hard work for them, that kind of work which will raise to a new high mark, the medical influence in our state of Minnesota.

B. J. Branton, M.D., *President*

Minnesota State Medical Association

Editorial

MINNESOTA MEDICINE

Official Journal of the Minnesota State Medical Association

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BUSINESS MANAGER
J. R. Bruce

Volume 24 DECEMBER, 1941 Number 12

MEDICAL STUDENTS AND THE RESERVE

IN our opinion there has been a good deal of unnecessary concern over the delay on the part of the medical students in the junior and senior classes in joining the Medical Reserve Corps of the army.

According to the Selective Service Act, as passed by Congress, no individuals or groups, except the clergy and divinity students, are exempt. Medical students are included in the draft with everyone else in the age groups.

The manifold increase in the size of the army has resulted in a shortage in the army medical corps. There is also a shortage in the United States Public Health Service, although there is none reported in the navy. In order to assure as large a corps of doctors as possible, the Surgeon Generals of the army and navy have put themselves on record to the effect that medical students who had reached the point of having been accepted by a medical school will not have their medical school training and year of internship interrupted as long as their scholastic standing is satisfactory. Naturally upon finishing their internship their deferment ceases and these young doctors are expected and required to do their patriotic duty by enlisting in the medical corps. If they do not enlist, and some suffer under the misapprehension that they are exempt because in the process of repeated deferment they have passed the twenty-eight year limit and are therefore exempt, they may find themselves carrying muskets.

The army is in need of more medical officers and more reserve officers and it is the desire of the Surgeon General to have the junior and senior medical students sign up in the Medical Officers Reserve. Only some 500 of the 10,000 medical students enrolled in the junior and senior classes of the medical schools of the country have so far joined. This is not necessarily a sign of gross lack of patriotism on the part of the neophytes in the profession, and the older members of the profession need not tear their hair because of the feeling that the present generation has departed from the pattern of patriotism they have set. The fact is that some of these undergraduate medical students have not felt assured that if they joined the medical reserve they would not be called until they had finished their internship. Doubtless many felt that there was no need to disturb the status quo of their relation to the draft and that signing up would naturally come upon completion of internship. Another reason why more undergraduates have not joined the reserve is that the medical schools have not, in some instances at least, made clear to the students the wishes of the Surgeon General and the fact that joining the Reserve Medical Corps will not interrupt their medical training. Doubt-

less before this statement appears in print this will have been done and many more than the 500 last reported will have signed up.

PRE-INDUCTION EXAMINATION

AS was mentioned in an editorial entitled "Selective Service," which appeared in our July number, the rejection of an appreciable number (10 per cent) of selectees by the induction boards has proven a source of inconvenience and at times embarrassment to those rejected.

According to a recent bulletin issued by the Selective Service state headquarters, this source of initiation will be removed. In the future pre-induction examinations by a United States Army examining board will be given several weeks in advance to those selectees classified as 1-A and 1-AO to determine whether they are acceptable for military service. These pre-induction examinations will be given at a United States Army examination station up to thirty days prior to induction. If acceptable these men will have a period of time in which to return home and settle their affairs before entering the army.

REPORT OF COMMITTEE ON VISUAL ECONOMICS*

The Committee on Visual Economics herewith submits a revision of the report of the Committee on Compensation for Eye Injuries, which was approved by the Section on Ophthalmology and adopted by the House of Delegates on May 26, 1925. This revision is made in accordance with the recommendation of this section adopted June 13, 1940.

The principles on which the report of 1925 were based are valid and no change in these is required. However, there have been presented three principal reasons which make a revision of this report desirable. These are:

1. To eliminate a recommendation in procedure which is inconsistent with the provision of most compensation statutes for determining visual disability.
2. To supply a few omissions and to correct some minor errors.
3. To clarify some steps in determining percentage losses of muscle function.

In the report of May, 1926, a recommendation was made "that compensation statutes be so changed that awards for ocular disability shall be based on the percentage of permanent disability only," that is, on the percentage loss of both eyes. No statute has been so changed; all statutes basing percentage losses of vision primarily on the loss to one eye. This recommendation in the 1925 report is now omitted as unnecessary. By following the principles laid down in the 1925 report, compensation could be computed on the basis of percentage loss to one eye or to both eyes and now no change is found necessary to determine the percentage functional efficiency of one eye. But it is suggested in this revision that the present common statutory method be followed—that is, that the method for determining the percentage loss of vision be based on the loss of efficiency of one eye, and that disabilities involving both eyes be based on a weighted method of computation.

The following revised report is submitted for action by the section:

Compensation for Eye Injuries

(Revised 1941)

SCOPE

The aim of this report is to establish a method of determining the loss of visual efficiency of a person who has suffered any degree of impairment of vision as the result of occupational disease or injury; such method to be the basis on which the amount of compensation may be determined.

SECTION I. BASIS FOR COMPENSATION

Compensation for loss of vision should be based on that proportional part of the compensation provided by law for loss of use, or loss of function, of one or of both eyes which expresses the percentage loss of visual efficiency of the individual in pursuing a gainful occupation.

Total permanent disability of both eyes is identical with permanent total disability of the individual.

The term visual acuity as herein used should be understood to mean absolute, that is, *best acuity obtainable with ophthalmic lenses.*

Visual efficiency is defined as that degree or percentage of competence of the eye to accomplish its physiologic function.

Loss of binocular single vision is equivalent to the loss of use of one eye.

The reduction in visual acuity to 20/200 (6/60 when the metric system is used), or a reduction in visual efficiency to 20 per cent or less, is the accepted standard of industrial blindness.

When both eyes are involved in a permanent visual disability the efficiency of the coördinate function of both eyes should be determined on the basis of permanent total disability of the individual.

SECTION II. THREE PRIMARY AND COÖRDINATE FACTORS OF VISION

There are three elements of vision, each of which has an interdependent and coördinate relation to full visual efficiency. These coördinate factors are (*a*) acuteness of vision (central visual acuity), (*b*) field of vision and (*c*) muscle function. Although these

*Report of the Committee on Visual Economics of the American Medical Association reprinted at the request of the Committee on Ophthalmology of the Minnesota State Medical Association.

factors do not possess an equal degree of importance, no act of vision is perfect without the coördinate action of all.

Other functions, though secondary and dependent, are recognized as important, such as depth perception, stereoscopic vision, fusion sense, color perception, adaptation to light and dark and accommodation. These functions are inherently dependent on the status of the three coördinating functions of vision, and they also depend on central nervous function.

SECTION III. MAXIMUM AND MINIMUM LIMITS OF THE PRIMARY COÖRDINATE FACTORS OF VISION

In order to determine the various degrees of visual efficiency, (A) normal or maximum, and (B) minimum limits for each coördinate function must be established; i. e., the 100 per cent point and the 0 per cent point.

A. *Maximum Limits.*—The maximum efficiency for each of these is established by existing and accepted standards.

(*a*) Central Visual Acuity: The ability to recognize letters or characters which subtend an angle of 5 minutes, each unit part of which subtends a 1 minute angle, is accepted as standard. Therefore a 20/20 (6/6 metric) Snellen is employed as the maximum acuity of central vision, or 100 per cent acuity.

(*b*) Field Vision: A visual field having an area which extends from the point of fixation outward 85 degrees, down and out 85 degrees, down 65 degrees, down and in 50 degrees, inward 60 degrees, in and up 55 degrees, upward 45 degrees, and up and out 55 degrees is accepted as 100 per cent industrial visual field efficiency.

(*c*) Muscle Function: A maximum normal muscle function is present when binocular single vision is present in all parts of the field of binocular fixation or when there is no limitation of motion in either eye.

B. Minimum Limits.—The minimum limit, or the 0 per cent of each of the coördinate functions vision, is established at that degree of deficiency which reduces vision to a state of uselessness.

(*a*) Central Visual Acuity: The minimum limit of this function is established as the loss of light perception, light perception being qualitative vision. The practical minimum limit of quantitative visual acuity is established as the ability to distinguish form. Experience, experiment and authoritative opinion show 20/200 (6/60 metric) Snellen as 80 per cent loss of visual efficiency, 20/380 (6/116 metric) as 96 per cent loss and 20/800 (6/240 metric) as 99.9 per cent loss. The table shows the percentage loss of visual efficiency corresponding to the Snellen notations in feet for distance and in inches for near for the measurable range of quantitative visual acuity.

(*b*) Field Vision: The minimum limit for this function is established as a concentric central contraction of the visual field to 5 degrees. This degree of contraction of the visual field reduces the visual efficiency to zero.

Percentage Loss of Visual Efficiency Corresponding to Snellen Notations for Distant and for Near Vision for Measurable Range of Quantitative Visual Acuity

Snellen Notation for Distance	Snellen-Notation for Near	Percentage of Visual Efficiency	Percentage Loss of Vision
20/20	14/14	100.0	0.0
20/25	14/17.5	95.7	4.3
20/30	14/21	91.5	8.5
20/35	14/24.5	87.5	12.5
20/40	14/28	83.6	16.4
20/45	14/31.5	80.0	20.0
20/50	14/35	76.5	23.5
20/60	14/42	69.9	30.1
20/70	14/49	64.0	36.0
20/80	14/56	58.5	41.5
20/90	14/63	53.4	46.6
20/100	14/70	48.9	51.1
20/120	14/84	40.9	59.1
20/140	14/98	34.2	65.8
20/160	14/112	28.6	71.4
20/180	14/126	23.9	76.1
20/200	14/140	20.0	80.0
20/220	14/154	16.7	83.3
20/240	14/168	14.0	86.0
20/260	14/182	11.7	88.3
20/280	14/196	9.7	90.3
20/300	14/210	8.2	91.8
20/320	14/224	6.8	93.2
20/340	14/238	5.7	94.3
20/360	14/252	4.8	95.2
20/380	14/266	4.0	96.0
20/400	14/280	3.3	96.7
20/450	14/315	2.1	97.9
20/500	14/350	1.4	98.6
20/600	14/420	0.6	99.4
20/700	14/490	0.3	99.7
20/800	14/560	0.1	99.9

(*c*) Muscle Function: The minimum limit for this function is established by the presence of diplopia in all parts of the motor field, the loss of binocular single vision, or inability to rotate the eye to any point of fixation in the normal motor field. These conditions constitute zero visual efficiency.

SECTION IV. MEASUREMENT OF COÖRDINATE FACTORS AND THE COMPUTATION OF THEIR PARTIAL LOSS

A. *Central Visual Acuity.*—Visual acuity shall be measured both for distance and for near, using the Snellen notation, each eye being measured separately. Central visual acuity for distance shall be measured at a test distance of 20 feet, or 6 meters. Central visual acuity for near shall be measured at a test distance of 14 inches, or 35 centimeters.

The estimation of the visual acuity is based fundamentally on the ability to distinguish letters or characters on a standard test card at a distance of 20 feet, or 6 meters. The near visual acuity test is a means of verifying the claimant's reliability. Thus, if without reason in the judgment of the examiner the visual acuity for near is less than that admitted for distance, the distance findings should be the final expression. In certain conditions (uncorrected myopia) the visual acuity might be somewhat greater for near than for distance. In such cases the visual acuity for distance

should stand. In other cases (such as high hypermetropia or cloudy media) the near visual acuity might be less than that for distance; then proper credit should be given the claimant—the average of the distance and near determinations given as final. For example, if the visual efficiency for near is 40 per cent and that for distance is 70 per cent, the central visual efficiency for the eye in question would be $\frac{40+70}{2} = 55$ per cent.

The best central visual acuity obtainable with ophthalmic lenses shall be used in determining the degree of visual efficiency.

If there exists a difference of more than 4 diopters of spherical correction between the two eyes, brought about by injury, the best possible vision of the injured eye without glasses or with lenses of not more than 4 diopters spherical difference from the fellow eye shall be the acuity on which subsequent rating is to be computed for this injured eye.

The Snellen test letters or characters (as published by the committee and designated "Industrial Vision Test Charts") subtending a 5 minute angle, and their component parts as 1 minute angle are standard. Those test letters are to be used at an examining distance from the patient of 20 feet, or 6 meters, for distant vision and 14 inches, or 35 centimeters, for near vision. The illumination is to be not less than 10 foot candles nor more than 20 foot candles on the surface of the chart.

The table shows the visual acuity and the percentage of loss of efficiency, both for distance and for near, for partial loss between 100 per cent and zero vision for one eye.

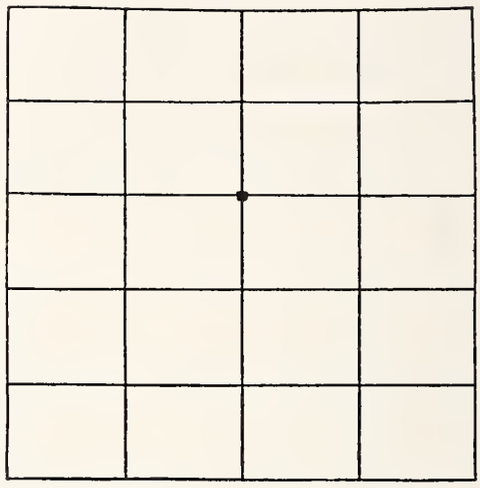
B. *Field Vision.*—The extent of the field of vision shall be determined by the use of the usual perimetric test methods, a white target being employed which subtends a one degree angle under illumination of not less than 5 foot candles, and the result plotted on an ordinary visual field chart.

The amount of radial contraction in the eight field sectors, measured in their principal meridians, shall be determined. The sum in degrees of the eight principal radii of the visual field, which normally is 500, will give the visual field efficiency of one eye in percentage when divided by 5: a 1 per cent loss is thus found for a meridianal contraction of 5 degrees for each of the eight sectors. The percentage loss may be computed thus: for example, if the field is contracted 20 degrees in all eight meridians there will be a loss of $20 \times 8 = 160$ degrees. This would amount to a loss of 160 divided by $5 = 32$ per cent field efficiency loss for the eye in question. If the field is contracted down to 5 degrees in every meridian the loss will be found to be 95 per cent. Suppose the entire temporal field is lost, the loss will amount to $65 + 85 + 85 = 235 \div 5 = 47$ per cent. If the upper inner quadrant is lost, the loss of field efficiency will amount to $55 \div 5 = 11$ per cent, and so on.

C. *Muscle Function.*—Muscle function shall be measured in all parts of the motor field, recognized methods being used for testing.

Traumatic strabismus (squint, heterotropia) may involve one or both eyes; this heterotropia is indicated by the presence of diplopia or by an inability of one or of both eyes to maintain fixation in some part of or in the entire normal motor field.

INDUSTRIAL MOTOR FIELD CHART



When diplopia is present, this shall be plotted on the motor field chart. This chart is divided into twenty rectangles 20 by 25 degrees in size, as shown in the chart. The partial loss to muscle function due to diplopia is that proportional area which shows diplopia as indicated on the plotted chart compared with the entire motor field area.

When the loss of muscle function cannot be determined by the presence of diplopia due to excessive degrees of strabismus and when it occurs in a one-eyed person, the degree of impairment must be determined by objective observation. The areas in which fixation is not possible shall be plotted on the motor field chart and the percentage loss of function computed by comparing the nonfixation areas with the entire motor field area. When there is total loss of binocular single vision, or when one eye is unable to fix on any point in the motor field, the percentage loss in visual efficiency is equivalent to the total loss and when the loss is partial the loss is proportional, based on the loss of use of one eye, provided the other eye has a normal field of fixation. Thus the loss of muscle function is rated as 5 per cent for each rectangle of the motor field in which there exists diplopia or loss of fixation.

In exceptional cases each eye may have its independent power of fixation impaired. In such cases the percentage loss of efficiency should be computed as a binocular disability as provided in section VI.

Diplopia or loss of fixation must be irremediable and based on the regulations as described in section VIII before compensation shall be awarded.

SECTION V. INDUSTRIAL VISUAL EFFICIENCY OF ONE EYE

The industrial visual efficiency of one eye is determined by obtaining the product of the computed coordinate efficiency values of central visual acuity, of field vision and of muscle function. Thus, if central visual acuity efficiency is 40 per cent, visual field efficiency is 81 per cent and the muscle function efficiency is 100 per cent, the resultant visual efficiency of the eye will be $0.40 \times 0.81 \times 1.00 = 32.4$ per cent. Should the motor efficiency be reduced 50 per cent in the example given, the visual efficiency would be $0.40 \times 0.81 \times 0.50 = 16.2$ per cent.

SECTION VI. INDUSTRIAL VISUAL EFFICIENCY OF THE COORDINATE FUNCTION OF BOTH EYES

It is a fact well established by common experience that visual efficiency is by no means reduced to one half (50 per cent) by the complete loss of one eye, vision in the fellow eye remaining normal; or that a permanent visual disability, total or partial, involving both eyes is not equivalent to the sum of the visual efficiency computed separately for each eye. Hence the necessity for a weighted average when a permanent binocular disability is present. The researches of the committee show that a weighing factor of 3 applied to the more efficient eye gives an efficiency rating of the individual in substantial agreement with the consensus of technical judgment, such judgment being based on actual reproduction, comparison and relative evaluation of various specific conditions of visual efficiency.

It should be noted that when an injury has involved both eyes and then this weighted principle is employed to determine the loss of visual efficiency of the individual, the factor of loss of muscle function efficiency, which is determined by the area of diplopia, should be used only in computing the efficiency of the less efficient of the two eyes. The estimation of visual efficiency of the more efficient of the two eyes is therefore based only on the efficiency computed by use of the factor of the percentage efficiency of central visual acuity and of the visual field of this more efficient eye.

The computation of efficiency of the coördinate function of both eyes follows: To the percentage figure which has been determined as the industrial visual efficiency of the less efficient of the two eyes, three times the percentage figure that has been determined similarly for the more efficient eye is added, and the result is divided by 4. The quotient will be the percentage figure that expresses the binocular visual efficiency. Thus, if efficiency rating of one injured eye is 40 per cent and that of the fellow eye is 80 per cent, the binocular visual efficiency will be found by the following formula:

$$\frac{(40 \times 1) + (80 \times 3)}{4} = \frac{280}{4} = 70 \text{ per cent;}$$

and the visual efficiency loss will be 30 per cent and compensation must be computed on the amount awarded for *total permanent disability of the individual.*

SECTION VII. TYPES OF OCULAR INJURY NOT INCLUDED IN THE DISTURBANCE OF THE COÖRDINATE FACTORS

Certain types of ocular disturbance are not included in the foregoing computations and these may result in disabilities the value of which cannot be computed by any scale as yet scientifically possible of deduction. Such are disturbances of accommodation, of color vision, of adaptation to light and dark, metamorphopsia, entropion, ectropion, lagophthalmos, epiphora, and muscle disturbances not included under diplopia. For such disabilities additional compensation shall be awarded, but in no case shall such additional award make the total compensation for loss in industrial visual efficiency greater than that provided by law for total loss of one eye when only one eye is involved and that for total permanent disability when both eyes are involved.

Compensation for loss in industrial visual efficiency, as provided for above, does not include compensation for any cosmetic defect, for mental or physical suffering, for cost of medical attention or for time lost from gainful occupation during the period of treatment previous to final computation of compensation as provided for below. Additional compensation should be awarded for the various losses here enumerated when not specifically provided for by statute.

SECTION VIII. REGULATIONS FOR COMPUTING COMPENSATION

Compensation shall not be computed until all adequate and reasonable operations and treatment known to medical science have been attempted to correct the defect. Final examination on which compensation is to be based shall not be made until at least three months shall have elapsed after all visible evidences of inflammation have disappeared, except in cases of disturbance of extrinsic ocular muscles, optic nerve atrophy, sympathetic ophthalmia and traumatic cataract; in such cases at least twelve months and preferably not more than sixteen months shall intervene before the examination shall be made on which final compensation is to be computed.

In cases of additional loss in visual efficiency when it is known that there was present a preëxisting subnormal vision, compensation shall be based on the loss incurred as a result of eye injury or occupational condition specifically responsible for the additional loss. In cases in which there exists no record or no adequate and positive evidence of preëxisting subnormal vision, it shall be assumed that the visual efficiency prior to any injury was 100 per cent.

IN FIFTY YEARS

In this country, the level of public health is the highest ever attained in the civilized world. But even that great achievement doesn't satisfy the medical men. They mean to achieve far more in the years to come. That is the way the medical mind works. It never stands still. It must always look forward.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

ONE HUNDRED YEARS IN PICTURES

The first medical picture review ever issued, called "One Hundred Years of Medicine in Minnesota," and published under the auspices of the Committee on Public Health Education, has just come off the press.

This unique publication is timed to mark the one hundredth anniversary of the coming of Christopher Carli, first civilian practitioner of medicine to settle in Minnesota. It is designed not only as a centenary observance, but as a vivid and graphic outline for lay readers of medical progress and facilities in Minnesota.

It is told in pictures with a minimum of text because all authorities set a far higher value upon the picture technique for popular education than upon orthodox editorial matter, no matter how well written or how attractively printed.

Publication of this book was made possible by friends of medicine whose names appear on the back cover. Through their interest and assistance it has been possible to broadcast the book widely among leaders of all groups in the state. Members of the Association were to receive copies for their waiting room tables early this month.

PROCUREMENT PLANS FOR DOCTORS

Plans for the new Procurement and Assignment Service for Physicians, Dentists and Veterinarians were outlined recently by Dr. Morris Fishbein, here for the annual dinner of the Minnesota Medical Foundation, and by Dr. H. S. Diehl, dean of medical sciences at the University, who is a member of the new service board.

The new service was created November 1 by executive order of the President, at the request of Social Security Administrator Paul V. McNutt, and will function only if a national emergency places procurement of personnel on a wartime basis.

Objective will be to supply essential professional personnel for the armed forces without unnecessarily depleting services at home.

Information taken from the American Medical Association questionnaires has been put on punch cards and will be made available to the service, Dr. Diehl said, in outlining progress before health officers of the state at the Minnesota State Sanitary Conference last month. More than two-thirds of the physicians of the country responded to the questionnaire.

Many Will Remain

Future needs for reserve officers will be modified somewhat by the fact that some 60 per cent of officers already called to military duty have indicated a desire to remain beyond the 18 month period, Dr. Diehl said.

Regulations for deferment of medical students subject to draft have been changed, he pointed out further, because the amendment excusing men of 28 or more from the service will automatically release many who reach that age before they have completed internships.

To avoid that and also to safeguard the supply of physicians, all junior and senior medical students will be commissioned, upon application, in the administrative branch of the Reserve Corps while still in medical school. They will then be subject to call as soon as they have completed their internship.

Advisory Committees

For those who wish to take fellowships, a special arrangement has been made in the shape of advisory committees to function in each Military Corps Area. These committees will investigate and advise corps commanders as to the need for deferment until the fellowship is completed, in each case.

No plans have been made as yet for using these Corps Area committees for other purposes but undoubtedly they could form a useful

function in the adjustment of many other problems connected with recruiting professional service for the military forces.

It is of interest to note that Major Samuel F. Seeley, graduate of the University of Minnesota and who has already won the confidence of both doctors and military officials in Washington, has resigned his other duties to become executive director of the procurement and assignment service with headquarters in Chicago.

Efficient administration of the office and sympathetic understanding of medical problems is regarded as assured under Major Seeley's direction.

TYING UP TO DEFENSE

Recent legislative bulletins from the American Medical Association indicate that proposals for health insurance and disability benefits have been considered in connection with plans for broadening the basis of present Social Security legislation but that they are still in the formative stage and action is doubtful this year.

Late reports from Business Executive Publications, Inc., have added information to the effect that a determination has been reached, as a result of White House-Treasury-Security Board conference on Social Security, to delay for the time being consideration of a plan for disability benefits of health insurance that would be financed by further payroll taxes.

At the same time the medical association bulletin warns that broadening of the Social Security program is being pushed as part of the defense effort and social aims of the Administration are bound to be implemented, at least in part, by tying their operation into the defense program.

PREPAYMENT PLANS FOR MEDICAL SERVICE

There is no question but what there is a continuing and ever increasing interest in prepayment plans for medical service.

Doctors are talking about them in medical and staff meetings. Lay organizations such as the League of Women Voters are again debating their merits—though, unfortunately, these latter are quite likely to confuse the issue and fall back upon polemics for and against private medicine.

The truth is, hospital plans have been so successful that, to an increasing degree, they are satisfying demands even of those who have been clamoring for prepayment plans for medical service. In the minds of most medical men, also, these hospital service plans have been doing a good job.

The story is different when it is a question of insurance for medical service, and it is difficult for laymen especially to realize the complications involved. Here we are dealing with individuals and individual illnesses which challenge standardization.

No Easy Matter

If we were back in the horse and buggy days, our problem would be simpler. Then people entered hospitals only as a last resort and the armamentarium of the doctor consisted chiefly of his stethoscope and his own excellent clinical judgment. In these days of x-ray and of complicated laboratory procedures and methods of diagnosis, the problem of costs for medical service is not an easy matter to solve on any basis.

The situation is further complicated because there are no definite checks upon patients who abuse privileges or upon doctors who do not understand that there are limits to the amount of service which can be rendered for funds available.

County and state medical societies in various parts of the country have organized prepayment plans for medical service in spite of these difficulties, on the trial and error method. Most of them have found that costs of home, office and hospital service exceeded expectations and have exhausted funds.

It is easy to understand how a small percentage of both patients and doctors can use up a disproportionate amount of funds with the result that the average return to the physician becomes very small.

The result in several instances has been to abandon complete service and limit prepayment arrangements to surgical benefits while in the hospital.

Surgical Service in Michigan

In Michigan, for example, where the experiment in prepayment service has been widespread and excellently managed, complete service has not worked, for the reason that premiums have

not been sufficient to cover the costs. Prepayment plans for surgical services alone have been tried out quite extensively in some large Michigan manufacturing plants, but not enough time has elapsed as yet to report on this limited type of service.

It is clear that investigation in this untried field has only begun. Much remains to be learned before anyone can say that this plan or that plan is the method of choice. Nevertheless, organized medicine must continue to study the question.

Some facts we must face. The status of free choice which has so largely prevailed in the past is already giving way to an increasing amount of panel practice in industrial medicine and elsewhere. Free choice exists in theory only, in many branches of practice. At the same time, the public is increasingly interested in methods of sharing costs of catastrophic illness and the concept of Social Security is sure to be translated, sooner or later, into terms of medical service.

"MOST NEGLECTED OF ALL CITIZENS"

The next time you see your doctor, feel sorry for him. He is the most neglected of all citizens, though no one will deny that he is the most valuable.

He is expected to be first in the aid and comfort of the people in time of epidemic and disaster and first in caring for the sick and hurt at all times, regardless of compensation. He must be the first to answer the call of his government to war to risk his life in trying to salvage the wrecks of battle.

And in return the Government does nothing for him from an economic standpoint. The doctor is denied the benefits of Social Security and similar protections which the Government provides for most of its citizens. No regulations on wages and hours or working conditions apply to him. No provision is made for his future. The doctor is the stepchild of our national family as far as the Government is concerned.

He does not have the safeguards with which the members of nearly all other professions surround themselves. He has no union, no other organization designed for anything more than the exchange of scientific ideas, no association for mutual benefits of a material nature. If you asked a doctor why his profession does not form a sort of guild and join the CIO or the A. F. of L., and take steps to protect the interests of doctors generally, he would be so shaken at the very thought that he would have to write a prescription for his own nerves.

We can just imagine the stir an organization of that nature would create throughout the land. There would be a great outcry, indeed, if the doctors decided they needed a union to better the conditions of their profession, say with reference to hours and compensation and pensions and working conditions in hospitals and elsewhere and to regulate the amount of service they render the public free of charge and to bring about a little more promptness in the settlement of bills among patients able to pay. It would be quite a spectacle to see a committee of distinguished union doctors picketing the premises of some notorious non-payer of medical fees.

But of course you will never see such an organization. The code of the profession requires that the doctor demean himself more rigidly than the rest of us in every way. It requires that he carry on with reference only to the ethics and the dignity of his calling and with no thought of his own welfare. Still, we think it is an unfair and unreasonable situation when the butcher and the baker are raising their prices on the doctor and the Government raising his taxes and he is expected to go along on his old scale. . . .

—Damon Runyon, in *New York Daily Mirror*

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Minneapolis Osteopath Sentenced to Stillwater For Abortion

Re: State of Minnesota vs. William L. Sheperdson

On October 27, 1941, William L. Sheperdson, 49 years of age, a licensed osteopath, was sentenced by the Honorable Frank E. Reed, Judge of the District Court of Hennepin County, to a term of not to exceed 4 years in the State Prison at Stillwater. Sheperdson had entered a plea of guilty on September 18, 1941, to an indictment charging him with the crime of abortion. The case was referred to the Probation Officer of Hennepin County for an investigation to determine whether or not Sheperdson should be placed on probation. That investigation disclosed that Sheperdson had been drinking excessively for several years and had the following criminal record in the Municipal Court of Minneapolis:

10/31/34—Driving while drunk—case continued.
1/14/35—Drunk—$10.00 or 10 days—stayed to 1/18/35.
1/18/35—Driving while drunk—driver's license revoked—ordered to pay previous fine.
1/25-35—Driving while drunk—90 days—probation to 1/10/36.
9/25/39—Assault and battery (on wife)—45 days (served 20 days).
11/22/39—Drunk—30 days—served.
8/ 5/40—Drunk—$10.00—paid.
8/31/40—Drunk—$5.00 or 5 days.
10/24/40—Drunk—$20.00 or 20 days—paid fine.

In the present case the complaint was signed against Sheperdson by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, charging Sheperdson with the crime of abortion. Sheperdson practiced osteopathy at 315 Masonic Temple Building, Minneapolis. Along in February, 1941, he became associated with David E. Rhoades in the performing of criminal abortions. Sheperdson stated that he had performed no abortions until that time. Since February Sheperdson and Rhoades performed 15 to 20 criminal abortions, according to Rhoades' statement. According to evidence furnished the authorities, a number of these abortion cases were referred to Sheperdson by several southern Minnesota osteopaths. Rhoades, who had no license to practice any form of healing, was sentenced on October 6, 1941, to a term of not less than 2 years, and not more than life imprisonment in the State Prison at Stillwater for his part in the abortions. The long sentence given to Rhoades was due, in part, to the fact that he had 3 previous felony convictions. In sentencing Sheperdson, Judge Reed stated that the defendant was in his present difficulty because of the excessive use of liquor, and that under the circumstances, the Court could not place him on probation. Judge Reed also stated that he would not oppose the defendant's release after he had served one year of his sentence. Sheperdson's case has been called to the attention of the State Board of Osteopathy for a possible revocation of his osteopathic license.

REPORTS and ANNOUNCEMENTS

MEDICAL BROADCAST FOR DECEMBER

The Minnesota State Medical Association broadcasts weekly at 10:45 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota.

December 6—Coronary Disease
December 13—High Blood Pressure
December 20—Rheumatic Heart Disease
December 27—Gingivitis

NINTH E. STARR JUDD LECTURE

Dr. Frederick A. Coller of Ann Arbor, Michigan, Professor and Director of the Department of Surgery at the University of Michigan Hospital, will give the ninth E. Starr Judd lecture at the University of Minnesota in the Chemistry Auditorium on Wednesday, January 21, 1942, at 8:15 p.m. The subject of Dr. Coller's lecture is "A Review of Studies on Water and Electrolyte Balance in Surgical Patients."

The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

AMERICAN UROLOGICAL ASSOCIATION AWARD

The American Urological Association offers an annual award, not to exceed $500, for an essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and if the committee on Scientific Research deem none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years.

Essays shall be in the hands of the secretary, Dr. Clyde L. Deming, 789 Howard Avenue, New Haven, Conn., on or before April 1, 1942.

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Dr. P. W. Brown of Rochester was named president of the Olmsted-Houston-Fillmore-Dodge County Medical Society at the annual meeting in Rochester, November 5. Dr. J. P. Nehring of Preston was named vice president, and Dr. M. J. Anderson was reëlected secretary.

POSTGRADUATE COURSES IN OBSTETRICS

Five postgraduate courses in obstetrics, each of four weeks' duration, will be offered at the Chicago Lying-in Hospital between January 12 and June 6, 1942. These are sponsored by the Illinois State Department of Health and the Children's Bureau of the U. S. Department of Labor. The features of the program consist of observations on current managements of normal and abnormal states of the pregnant, parturient, and puerperal patient. Lectures, demonstrations, clinics, and other teaching means augment the operating room and birth room observations, and ward-round discourses. The course is run on a non-profit basis. A deposit of $25.00 is required on registration, $10.00 of which is refunded at the completion of the course. All the members of the department participate in giving the courses. Additional information and application blanks may be obtained by request from Postgraduate Course, Department of Obstetrics and Gynecology, 5648 Drexel Avenue, Chicago, Illinois.

BLUE EARTH VALLEY MEDICAL SOCIETY

The annual meeting of the Blue Earth Valley Medical Society was held November 7 in Blue Earth. Dr. Willard White of Minneapolis gave an illustrated lecture on fractures.

Officers elected were: Drs. J. J. Heimark of Fairmont, president; Dr. M. P. Virnig of Wells, vice president; and Dr. J. L. Mills of Winnebago, secretary-treasurer.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases
J. L. McLeod, Grand Rapids, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
G. L. Berdez, Duluth
T. G. Clement, Duluth
W. S. Lemon, Rochester
T. A. Lowe, South Saint Paul
R. I. Rizer, Minneapolis
S. E. Sweitzer, Minneapolis
O. H. Wangensteen, Minneapolis
A. E. Wilcox, Minneapolis

MINNESOTA'S PROGRAM

IN 1939, the Minnesota State Legislature passed an act requiring the reporting of occupational diseases and providing for the investigation and control of poisoning and disease contracted as a result of the nature of employment. The administration of this act was delegated to the State Department of Health. Early in 1940, an Industrial Hygiene Unit was organized within the Department of Health. In July of this year, the status of the Industrial Hygiene Unit was changed to that of a Division of Industrial Health.

Many of the details of the program of the newly formed division remain to be worked out with the Medical Society, representatives of organized labor and industry, the State Industrial Commission and others.

The general outline of the program is as follows:

1. To receive and investigate reports of occupational disease.

2. To promote more adequate medical services within industry; such as the employment of full-time or part-time physicians and nurses, the provision of properly equipped first aid rooms, and the maintenance of sickness records.

3. To encourage the use of ethical preëmployment and periodic physical examinations and, as a part of these examinations, the use of the routine serologic test for syphilis. It is advocated that the positive test for syphilis should not be used as a means of discrimination against an employe providing he secures adequate medical treatment, unless he has syphilis in a communicable stage, or sufficient involvement of the heart or central nervous system to be a hazard to himself or his associates.

4. To confer with industrial physicians in regard to special problems or general industrial health programs. Special urine and blood analyses for evidence of industrial intoxication will be done when warranted. Occasional physical examinations will be made as an aid in evaluating the seriousness of certain industrial exposures.

5. To provide engineering personnel who are specially trained and equipped to make studies of plant environment; such as air analysis for toxic vapors, gases, and dust, in effort to determine whether the working atmosphere is safe or otherwise and to make recommendations for the control of health hazards found. These studies will be made at the request of physicians, plant managements, the State Department of Labor and Industry, and others concerned with the health and welfare of the industrial worker.

6. To promote adult hygiene programs within industrial groups; such as the control of tuberculosis, syphilis, and other communicable or preventable diseases. This requires the coördination of other services and facilities within the Health Department.

7. To prepare and disseminate information on various toxic materials and processes, and methods for their control.

Since the onset of the National Defense Program, the Division of Industrial Health has concentrated the greater part of its effort within those industries engaged in filling defense contracts. With the rapid expansion which commonly takes place in such industries, new and unused buildings will be utilized, new processes and materials will be employed, many engineering changes will be made, and both skilled and unskilled labor will be added to the payroll. Often in such rapid expansion of activities, control measures are not kept in pace with the effort to speed up production. New materials are handled without due consideration for their potentially toxic effects. It is in the control of these processes and in the promotion of better health services within these industries that the Division of Industrial Health of this state can be of service in safeguarding the health of our industrial workers and promoting our national defense.

L. W. FOKER

In Memoriam

Franklin William S. Raiter

Franklin William S. Raiter died at his home in Cloquet, Minnesota, October 2, 1941, stricken by a cerebral hemorrhage. In 1938, he had a stroke from which he made a gradual but not complete recovery. He was in reasonably good health and attended the Minnesota State Medical meeting at Saint Paul in May, 1941. His recent cerebral accident, however, was fatal.

Franklin Raiter was born September 3, 1889, in Stillwater, Minnesota. He was the son of Frank and Elizabeth Raiter who moved to Cloquet when their children were very young.

Franklin went to school in Cloquet and graduated from the high school there. He attended the University of Minnesota and later received his medical degree from Marquette University, Milwaukee, in 1911. He entered medical practice in Cloquet in 1914.

Almost at once he entered the United States Army Medical Service and received a commission as lieutenant, later captain in the Minnesota National Guard. He was attached to this outfit on the Mexican border, and overseas in 1917 during the World War.

After being discharged, Dr. Raiter spent several months at Bellevue Hospital in New York City before returning home to resume his practice in the summer of 1919. From that time until his illness in 1938, Dr. Raiter was one of the leading physicians in his district. He kept abreast of modern developments in medicine by attending numerous clinics both in this country and during two trips to Europe.

Despite the heavy demands of his widespread practice, Dr. Raiter devoted considerable time to civic duties. For about twenty years he was a member of the school board and at the time of his illness he was its president. He served as city health officer and county coroner for approximately twenty-five years and it was a local political byword that he never had to campaign for reëlection.

He was a member of the Minnesota State Medical Association, the St. Louis County Medical Society, the American Medical Association, the American Obstetrical and Gynecological Society, the U. S. Military Surgeons' Association, the Zion Lutheran church, the Dalles lodge, the Shriners, the American Legion, the Fraternal Order of Eagles, the Odd Fellows, the Sons of Norway and the Branting lodge, Vasa Order of America. He was a charter member and past president of the Rotary Club.

He had no outstanding hobbies outside his profession. He played a little golf and went fishing occasionally. The men at the paper mill, where he worked as a boy, often found him sitting in their midst during the noon hour, visiting. He was often late to his office because he had stopped at some farmhouse to chat with old friends.

With his medical confreres he was always cheerful and cordial. He will be sadly missed by all who knew him.

Dr. Raiter is survived by his widow; one son, William; two sisters, Mrs. John Spargo and Miss Frances Raiter, Chicago, and two brothers, Dr. Roy Raiter and Roscoe Raiter, Cloquet.

—A.N.C.

Robert Graham

Dr. Robert Graham was born in Shetland, Ontario, in 1865 and died in Duluth September 22, 1941, at the age of seventy-six years.

He was graduated from the Wardsville High School and later from the Strathroy College Institute. He received his medical degree from the Wayne University College of Medicine, Detroit, Michigan, in 1893 and the same year was licensed to practice medicine in Minnesota.

He then located in Duluth but after a short time accepted a position as mine surgeon for some of the mines at Hibbing, Minnesota. A year later he returned to Duluth where he maintained his offices until shortly before his death. He was a member of the St. Louis County Medical Society, Minnesota State Medical Association and the American Medical Association.

Soon after establishing himself in Duluth he married Miss Augusta Oppel, a member of one of Duluth's early families. She and two daughters, Mrs. Norman Seiter of Utica, N. Y. and Mrs. Herbert Bartholdi of Saint Paul, survive him.

Dr. Graham stood high in Elkdom and in Masonry. He had taken the Scottish Rite degrees and was an Aad Temple Shriner. Early in his medical career he was appointed county physician to St. Louis County. He performed the duties of this office creditably and well for many years, until the infirmities of advancing age caused him to resign the office. He took several postgraduate courses in his earlier years, endeavoring ever to seek inspiration and keep himself abreast of the times. He was a past president of St. Louis County Medical Society and had served as Chief of Staff of St. Lukes Hospital in Duluth. He had taken a very active and influential part in the affairs of the hospital during all his years in Duluth. As the years slipped by and his work increased he chose to limit it to surgery only. During many years he was looked upon as one of Duluth's leading surgeons.

He had been very active in the organization of the Duluth Automobile Club and the furtherance of its good work. Its value to the community was in no small degree due to his influential efforts.

Robert Graham was a doctor of the old school. His interest in his patients was always friendly. He was kindly, patient and possessed of a spirit of tolerance to an unusual degree. His homely comparisons, nearly always tinged with humor, characterized the man's attitude toward life better than anything else excepting his work itself to which he brought a high sense of fidelity to duty.

S.H.B., Sr.

Meeting of October 8, 1941

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 8, 1941. Dinner was served at 7 o'clock and the meeting was called to order at 8 p.m. by the president, Dr. J. M. Armstrong.

There were fifty-four members present.

Minutes of the May meeting were read and approved.

The scientific program followed.

SOME PROBLEMS IN AVIATION MEDICINE

Maurice B. Visscher, M.D.

Dr. Visscher, of the Department of Physiology, University of Minnesota, read his Inaugural Thesis on the above subject. Lantern slides and charts were shown.

Summary

The aspects of aviation medicine which give it a distinct character arise from the behavior of the human organism in adjusting itself in new and different environmental situations. Consequently, by definition the peculiar problems of aviation medicine are physiological ones. The unusual environmental situations to which the human body is exposed in aviation may be divided into four general categories. They are: (1) altered total atmospheric pressure; (2) altered oxygen tension; (3) accelerational forces; and (4) variable situation in space. Rapidly decreasing total atmospheric pressure sets up the conditions for decompression disease. Symptoms comparable to those found in caisson disease occur in aviators. They are presumably due to bubble formation in the blood and tissue. The mechanism by which bubbles, which are new phases, are formed in fluids when the pressure over them is reduced is still obscure. Different individuals show varying degrees of severity of symptoms during decompression. The tolerance of the body to lowered oxygen tension is critical in relation to the altitude at which human flight is possible. Again, there are individual differences in susceptibility. The discovery of means for raising the altitude ceiling of aviators constitutes one of the most important problems in aviation medicine. Results of experiments were presented indicating that various chemical agents influence susceptibility to the effects of oxygen want. The accelerational forces to which the body is exposed in flying maneuvers is very much greater than those to which a human body is subjected under other conditions of life. The magnitude, the direction and the duration of application of accelerational forces are all important to the effect produced. Applied forces of a certain intensity and duration have greater effects if the action is in the long axis of the body than they have if they are applied in the direction of shorter axes. In practice, it has been found that the assumption of a crouching position during turns gives considerable protection to aviators. Postural reflexes having their origin in end organs in the vestibular apparatus lead to erroneous and undesirable responses in pilots. Visual and deep pressure sensations provide, in general, reliable information. A large number of physiological problems in connection with the behavior of the human body in flight still await satisfactory solution. Progress in aviation practice today depends at least as much upon equipping flying personnel so that they are capable of utilizing the capacity of the modern airplane as upon any other factors. Airplane motors can operate at higher altitudes than the human can tolerate. Airplane bodies are structurally able to bear greater accelerational stress, than can the human body. Air craft can ascend at greater rates than can be tolerated by the occupants of the plane unless they are specially prepared. There is an obvious place for fruitful physiological investigation in the attempt to solve these practical problems.

Discussion

Dr. Max Alberts, Saint Paul: I have enjoyed Dr. Visscher's paper a great deal and wish to compliment him on his fine presentation of this most interesting subject. I would like to ask him if there has been any experimental work done on the so-called anticipation of direction, which I believe can be explained on some personal experience and observation. Some twenty years ago I had an opportunity to do considerable flying, and at that time so-called stunt flying in its various phases was quite a popular pastime. It was my observation that the passenger after going through various maneuvers often became very nauseated, frequently followed by vomiting, and in some cases loss of consciousness results, while the pilot suffered no reactions whatsoever. However, when the situation was reversed and the pilot acted as a passenger, very often the same reactions were experienced by him. In other words, the pilot, knowing exactly what was to transpire during the maneuver, could adjust himself accordingly—he "rode the plane" instead of fighting the change of direction. This would seem to me a rather important factor both in large military planes which carry several in the crew and even the large transport planes used in civilian aviation, although I realize that the type of flying is entirely different from that experienced in the small combat planes.

Dr. Visscher, (in closing): I am sure that is correct. I think there is probably a relatively simple explanation, and that is the posture assumed by the person who is expecting this thing. The pilot is able to assume a more desirable posture, knowing what is going to happen.

I know there is work going on in one or two American laboratories, such as you mention. We have only two centrifuges in this country as compared with 8 or 10 in Germany. Very little experimental work can be done right in the planes because they can't carry the equipment necessary. The place to do it is probably in centrifuges. I wish I could go into the point you mention with more assurance. I can't tell you what has been done because I haven't gone over all the literature.

The meeting adjourned.

E. V. Kenefick, M.D.
Secretary.

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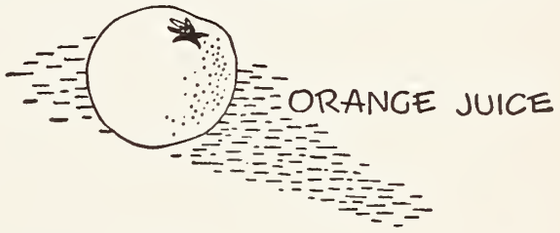
2. Add enough warm, previously boiled water to make one ounce.

3. Cap bottle and shake into solution. Feed at body temperature.

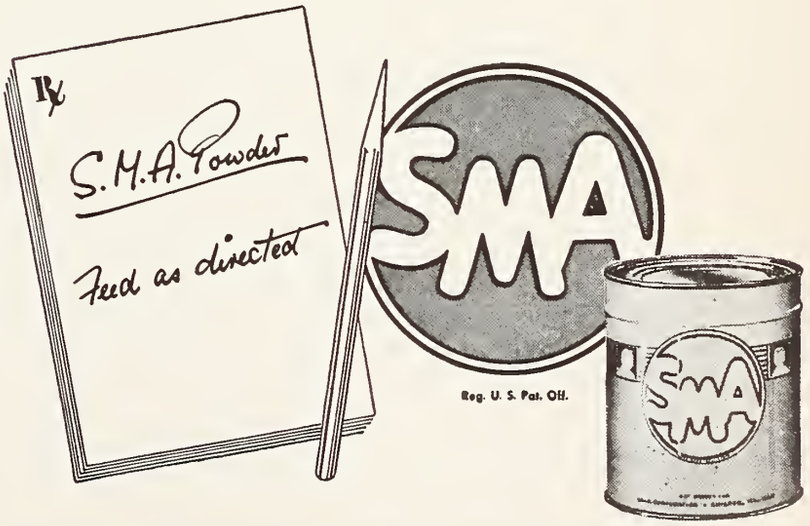
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OF GENERAL INTEREST

Dr. William Rademaker of Detroit Lakes has become associated with the Shipman Hospital in Ely.

* * *

Construction of a 42-foot addition to the Hart Hospital in Monticello has been begun by Dr. W. E. Hart.

* * *

Dr. Cyril Smith of Duluth has been appointed a member of the Minnesota Boxing Commission, his term to run until January, 1943.

* * *

Dr. Donald W. Johnson of Fairmont is announced as the first prize winner in the photography division of the 1941 American Physicians' Art Association contest.

* * *

Dr. C. L. Oppegaard of Crookston gave an illustrated talk on surgical technique at the fall meeting of the Red River Valley Medical Society held at Warren, Minnesota, October 28.

* * *

Dr. and Mrs. W. C. Stillwell, Mankato, Minnesota, were in Boston, November 3 to November 8, where Dr. Stillwell attended the American College of Surgeons meeting.

* * *

Dr. Robert Gray, who has been associated with the Marshall Clinic at Marshall, has joined the "Medical Aid to Britain" division of the American Red Cross and has gone to England for active service.

* * *

Dr. W. L. Herbert, who has practiced in Granite Falls for the past ten years, has moved to Minneapolis where he has opened offices at 307 East Hennepin for the practice of general medicine and surgery.

* * *

Dr. G. C. Strauss has become associated with Dr. Robert Bray at the Biwabik Hospital in Biwabik. Dr. Strauss interned at St. Luke's hospital in Duluth, and since July had practiced at Grand Marais.

* * *

Dr. Reynold A. Jensen, assistant director of the Psychiatric Clinic for Children at the University of Minnesota, addressed the South Dakota Public Health Nurses Association at Mitchell, November 14. His subject was "Psychiatry and the Public Health Nurses."

* * *

Dr. Charles W. Rogers has purchased the Southwestern Minnesota Hospital in Heron Lake from Dr. Alfred G. Chadbourn, with whom he has been associated since March, 1938. Dr. Rogers is a graduate of the University of Minnesota Medical School, Class of 1935, and served his internship in St. Mary's hospital in Duluth.

* * *

Dr. Reino H. Puumala of Cloquet recently was named coroner for Carlton County, filling the vacancy caused by the death of Dr. F. W. S. Raiter, who had served in that capacity for twenty-five years.

The Masonic lodge of Caledonia honored Dr. and Mrs. De Costa Rhines, who recently moved from Caledonia to Owatonna, at a reception, October 30. Dr. Rhines practiced in Houston County for many years.

* * *

Dr. Benjamin F. Swezey has reopened offices in Buffalo after an absence of four years. Dr. and Mrs. Swezey left Buffalo to go to Iowa and later they moved to Bellingham, where Dr. Swezey was in practice for some time.

* * *

Dr. Russell M. Wilder of Rochester was one of a group of alumni distinguished for outstanding activity in a special field, who was awarded a medal by the University of Chicago at the recent celebration of its fiftieth anniversary.

* * *

Dr. D. C. Balfour of Rochester has been appointed an honorary consultant to the Medical Department of the United States Navy. The appointment was made upon the recommendation of the Secretary of the Navy to the President.

* * *

Dr. Theodore C. Erickson, a graduate of the University of Minnesota Medical School in 1930, has been appointed associate professor of surgery at the University of Wisconsin. A native of Saint Paul, Dr. Erickson has been staff surgeon at the Montreal Neurological Institute in Montreal.

* * *

Dr. E. M. Hammes of Saint Paul was elected president of the Central Neuropsychiatric Association at its meeting in Detroit and Ann Arbor, Michigan, the latter part of October. Dr. William Smith of Indianapolis was named vice president, and William Menninger of Topeka, secretary-treasurer.

* * *

Dr. Waltman Walters of Rochester lectured at the Klahr Auditorium in Philadelphia, November 18, under the Constantine Hering Fund of the Hahnemann Medical College and Hospital of Philadelphia. His subject was "Malignant Lesions of the Stomach." Dr. Walters was honored at a dinner preceding the lecture.

Dr. Walters has been named a member of the National Advisory Cancer Council, succeeding Dr. James B. Murphy of the Rockefeller Institute.

* * *

Trustees of the Minnesota Medical Foundation were reëlected at the annual dinner in the Coffman Memorial Union, November 7. They are Drs. Erling S. Platou and Robert L. Wilder of Minneapolis and Dr. George A. Earl of Saint Paul.

Dr. Morris Fishbein of Chicago, editor of the *Journal of the American Medical Association,* spoke.

The Foundation's bulletin appeared in November in a new form under the title of "Trends in Medical Practice and Research."

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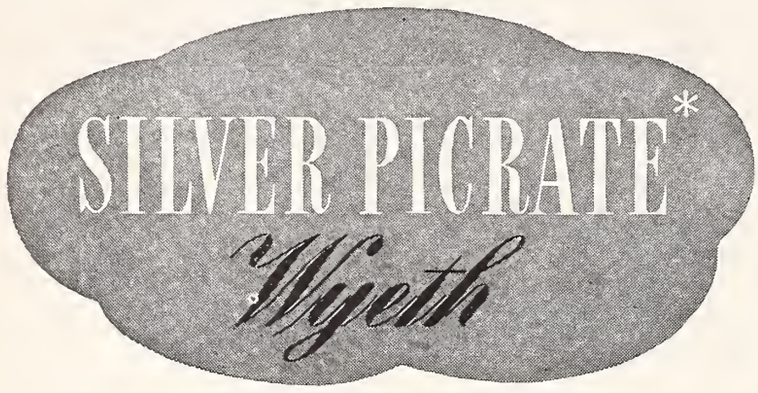
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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., **23**, 201 (March), 1939.

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Among speakers at the Post-Graduate Medical Assembly of South Texas, which presented its tenth annual clinical meeting December 4 in Houston, was Dr. William C. MacCarty of Rochester.

* * *

Dr. Peter D. Ward, medical superintendent of Charles T. Miller Hospital in Saint Paul, has been named a member of the permanent Hospital Service Commission of the American Hospital Association which was established during the recent annual meeting of the association.

* * *

Recently relieved from extended active duty with the United States Army were: Dr. Bruce M. Anderson of Rochester and Dr. George J. Halladay of Brainerd. Both are first lieutenants, and were assigned to Camp J. T. Robinson, Arkansas.

Orders of Dr. Nesmith P. Nelson of Brainerd, captain, to report for active duty, have been revoked.

* * *

Dr. Paul W. Searles, a former fellow in anesthesia in the Mayo Foundation, has been appointed professor of anesthesia and head of that department in the School of Medicine at the University of Buffalo. Dr. Searles received the degree of Master of Science in anesthesia from the University of Minnesota while at the Mayo Clinic.

* * *

Dr. P. N. Pastore of Rochester has received the appointment of professor of otolaryngology and rhinology at the Medical College of Virginia in Richmond. The appointment becomes effective January 1, 1942.

Dr. Pastore is a member of Sigma Xi and has been certified by the American Board of Laryngology. He received the degree of M.S. in Otolaryngology and Rhinology from the University of Minnesota while at the Mayo Clinic.

* * *

Dr. Donald C. Balfour, of Rochester, director of the Mayo Foundation, received an honorary doctor of laws degree at a special convocation at the University of Toronto, Canada, his alma mater, October 24. Dr. Balfour received his M.B. degree there in 1906 and his M.D. degree in 1914.

The honorary LL.D. degree is Dr. Balfour's second, the first being awarded by Carleton College, Northfield, in 1934. Last May he was awarded an honorary degree of Doctor of Science by McMaster University in Hamilton, Ontario.

* * *

Dr. Owen H. Wangensteen, head of the department of surgery at the University of Minnesota Hospitals, is chairman of the Forum on Fundamental Surgical Problems which held its first meeting at the Clinical Congress of the American College of Surgeons in Boston, November 4 to 7.

Papers presented were by a number of Minnesota men: Dr. Arnold J. Kremen, Dr. Wangensteen, Dr. N. Kenneth Jensen, Dr. Richard L. Varco, Dr. N. Logan Leven, Dr. Clarence Dennis, Dr. John R. Paine, Dr. Charles F. Code, Dr. Lyle J. Hay and Dr. Bernard Lannin of the University of Minnesota medical school.

Also Drs. A. E. Osterberg, S. B. Harper, Asher S. Chapman, James T. Priestley and W. R. Lovelace of Rochester.

* * *

The annual dinner meeting of the general medical faculty of the University of Minnesota was held November 6 in the Coffman Memorial Union.

Dr. Wallace H. Cole, who recently returned from England, spoke on his experiences as director of the American Hospital in Britain, and Dean Theodore C. Blegen of the Graduate School, discussed "Glimpses of Northwest Medical History."

Dr C. D. Creevy, assistant dean of the Medical School, presided in the absence of Dr. Diehl. A special guest at the dinner included the president of the university, Walter C. Coffey.

* * *

Dr. Walfred Johnson, who has been in practice in Sauk Center since 1926, has gone to Chatham, Massachusetts, to assume the practice of a physician called into active service of the U. S. Marine Corps. Chatham is near Dr. Johnson's home town of Worcester.

Taking over Dr. Johnson's practice during his absence is Dr. Karl Pleissner of Minneapolis, a graduate of the University of Minnesota Medical School.

Dr. Johnson, who plans to be away from Sauk Center for just a year, purchased the practice of the late Dr. E. J. Lewis, father of the famous novelist, Sinclair Lewis, in 1926.

* * *

Governor Stassen has appointed as a member of the Minnesota Committee of the White House Conference on Children in a Democracy, Dr. R. L. J. Kennedy of Rochester. Dr. John Anderson, director of the child welfare institute at the University of Minnesota, has been named chairman of the committee.

Dr. Henry R. Helmholz, Rochester pediatrician, is a member of the National Citizens' committee and will serve as liaison officer between that community and the Minnesota group, which will act as the child welfare section of the Minnesota welfare defense advisory committee.

* * *

Dr. John L. Rothrock of Saint Paul has given a gift of $50,000 to Gettysburg College in Gettysburg, Pennsylvania, from which he received his B.A. degree in 1885.

Dr. Rothrock, who took his medical work at the University of Pennsylvania, practiced in Saint Paul from 1890 to 1936 when he retired from active practice. He was made professor emeritus of obstetrics and gynecology at the University of Minnesota Medical School in 1936, having served on the medical faculty since 1895.

Dr. Rothrock received a Doctor of Science degree from Gettysburg in 1934.

* * *

Dr. W. Randolph Lovelace of Rochester is the newly elected president of the Aero Medical Association of the United States. He was named to that office at the association's annual meeting in Boston, October 31-November 2.

Dr. Lovelace, co-winner with Dr. Walter Boothby of



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recognition in the award of the Collier aviation trophy last year, is one of the youngest men ever to head the association.

Drs. Lovelace, Boothby, J. H. Tillisch, H. C. Hinshaw, together with Dr. Arthur Bulbulian (dentist), of the Mayo Clinic presented papers at the meeting.

* * *

A bronze statue of the late Drs. William J. and Charles H. Mayo in their surgical gowns will be the central point of interest of the Mayo Memorial Shrine to be erected in Rochester by residents of Rochester and Olmsted County.

The shrine, which was designed by James Earle Fraser, New York sculptor, will be separate and distinct from that being planned by the Minnesota Memorial Commission headed by Senator William B. Richardson.

The bronze statue will be placed on a granite base before a granite background in the central open space of an amphitheatre, symbolic of operating rooms.

* * *

Approximately fifty persons registered for the course of lectures, demonstrations and clinics concerned with problems related to medical and surgical emergencies in civilian and military practice, given at Rochester the week of November 10, under the direction of the Mayo Foundation.

Among the lecturers was Sir John Boyd Orr of London, scientific adviser to the minister of nutrition of Great Britain, who spoke on "The Rôle of Nutrition in War and Peace," and Dr. Wallace H. Cole of Saint Paul, who discussed his experiences in orthopedic surgery in England.

The scientific and clinical programs were presented by staff members.

* * *

The American College of Surgeons at its meeting in Boston last month announced the addition of sixteen more hospitals to its 1940 list of 200 approved for training in surgery.

This addition will provide training for fifty-six more graduate students in surgery, bringing the total locations to 697. The present appointments exceed the number of men available to fill them, 101 vacancies already existing on the resident staffs in surgery at the approved hospitals. It is questionable whether the present emergency should be allowed to interfere with the training of qualified surgeons.

The Minnesota hospitals approved by the college are: Minneapolis General, University Hospitals, Mayo Foundation, Ancker, Miller and Gillette Hospitals.

* * *

Former fellows in the Mayo Foundation, who majored in pediatrics and were associated with Dr. Samuel Amberg of Rochester, honored him at a surprise dinner, October 31.

There were sixty guests, including a large number of former residents who were in Rochester for the annual meeting of the Alumni Association of the Mayo Foundation.

Dr. Amberg was presented with a book compiled by his former associates and consisting of contributions

written by them. To the pediatrics department at the Mayo Clinic went an etching of Dr. Amberg, the portrait also a gift of the former residents.

Dr. R. L. J. Kennedy was master of ceremonies.

Dr. Amberg, who is associate professor of pediatrics in the Mayo Foundation, has been associated with the Mayo Clinic since 1921.

* * *

Dr. William H. Long of Fargo, North Dakota, was elected president of the Alumni Association of the Mayo Foundation for Medical Education and Research, which held its twenty-third annual reunion in Rochester, October 29-31. Dr. Long succeeds Dr. Porter P. Vinson of Richmond, Virginia.

Other officers named are: Dr. J. M. Blackford, Seattle, Washington, first vice president; Dr. T. J. Kinsella of Minneapolis, second vice president. Dr. E. L. Meland of Minneapolis was reëlected secretary, and Dr. D. Morrison Masson of Rochester, associate secretary and treasurer.

Dr. C. F. Dixon of Rochester was elected to the board of governors.

Approximately 140 visitors registered for the three-day session.

* * *

Medical reserve officers called to active duty with the United States Army within the past few weeks include:

Stanley S. Chunn, Pipestone, first lieutenant, Corps Area Service Command Station Hospital, Fort Leavenworth, Kansas.
William Ginsberg, Saint Paul, major, Anti-aircraft Training Center, Camp Hulen, Texas.
Robert Fred Golden, Rochester, captain, Corps Area Service Command Station, Camp J. T. Robinson, Arkansas.
Carl Alfred Hanson, Minneapolis, first lieutenant, Corps Area Service Command Station Hospital, Fort Snelling, Minnesota.
Homer H. Hedemark, Thief River Falls, captain, to Fort Leonard Wood, Missouri.
Linneus Godfrey Idstrom, Ah-gwah-ching, first lieutenant, to Fort Snelling.
Donald Everett Ralston, Minneapolis, first lieutenant, Fort Snelling.
Bernard Selinger, Red Lake, first lieutenant, 368th Infantry, Fort Huachuca, Arizona.
Carl Oliver Thompson, Hendricks, first lieutenant, Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyoming.
John Gordon Griffin, Rochester, first lieutenant.
Leonard Wood Moody, Ah-gwah-ching, first lieutenant.
Earl V. Wetzel, Jr., Little Falls, first lieutenant.

* * *

Dr. Harold S. Diehl, dean of medical science at the University of Minnesota, has been named a member of the five-man board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, which was established in the Office of Defense, Health and Welfare Service on executive orders. Dr. Diehl attended the organization meeting in Washington, D. C., November 6.

Among members of sub-committees, which will function under this Service, are the following University of Minnesota faculty members: Dr. Gaylord W. Anderson, a member of the sub-committee on public health; Dr. Ruth E. Boynton, sub-committee of women physicians in the defense program.

The functions of the new service include procurement of personnel for emergency needs, and the needs of medical service for civilian defense and other civilian needs.

In addition to this post, Dr. Diehl is a member of the Committee on Preparedness of the Association of



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American Medical Colleges. He is also a member of the executive council of that organization.

* * *

Faced with a critical need for physicians to serve as Associate Medical Officers in the federal civil service in such agencies as the Veterans Administration, the United States Public Health Service, the Indian Service, and others, the civil service commission is announcing a new medical officer examination.

The examination covers three grades: Associate Medical Officer, $3,200 a year; Medical Officer, $3,800 a year, and Senior Medical Officer, $4,600 a year. Applicants for the Medical Officer grade must have graduated from a medical school (Class A) since May 1, 1920, and for the Associate grade, since May 1, 1930. No specified time limit is set for graduation for the Senior grade.

No written test is required. Applicants are rated upon their education and experience. Senior Medical Officers must have had professional experience in one of the following: Aviation medicine; cardiology; and public health (general). Qualifying optional branches for the Medical Officer and Associate Medical Officers include: Aviation medicine; cardiology; dermatology; eye, ear, nose, and throat (singly or combined); general practice; industrial medicine; internal medicine and diagnosis; medical pharmacology; neuropsychiatry; pathology, bacteriology, and roentgenology (single or combined); public health; surgery; tuberculosis; urology; and cancer. The maximum age limit for all grades has been raised to *fifty-three.*

Because of the demand, persons who can qualify for the Associate Medical Officer grade, are urged to apply. Applicants for this grade need not have had experience other than one year of internship, general rotating, or in an optional branch. For this grade, applications will be accepted from persons who are now serving but who have not yet completed internship; but they must complete their internship before entering on duty.

Announcements and application forms may be obtained at any first- or second-class post office, or from the Civil Service Commission, Washington, D. C.

* * *

Dr. Louis Blanchard Wilson, director emeritus of the Mayo Foundation, was honored by the Mayo Foundation chapter of Sigma Xi, November 8, at a dinner in Rochester which 115 persons attended. Dr. Wilson was national president of the fraternity in 1932 and president of the Mayo Foundation chapter in 1924.

Two speakers came from out-of-town to cite Dr. Wilson's work. They were Dr. Albert J. Chesley of Saint Paul, secretary of the Minnesota State Public Health Department, who told of Dr. Wilson's activities in public health work; Colonel George Callender of Washington, D. C., who told of his study on the effect of gunshot wounds.

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Other of Dr. Wilson's achievements were recounted by Dr. Edgar V. Allen, who extolled his work in the Sigma Xi organization; Dr. Donald C. Balfour, director of the Mayo Foundation, who related his attainments in medical education and research; Dr. William C. MacCarthy, whose subject was "Dr. Wilson in the Clinic Laboratories"; Dr. A. H. Sanford, who spoke of Dr. Wilson's activities in arts and crafts; Dr. A. C. Broders, who cited his interest in hunting; and Dr. L. W. Pollock, who pictured Dr. Wilson as a horticulturist.

* * *

A new teaching program for junior and senior classes in the University of Minnesota Medical School will be inaugurated next fall.

The most revolutionary change made in the curriculum for years, the new plan abolishes the quarter system (90-day quarters), and instead divides the junior and senior years into five periods of 73 days each.

Four divisions of the class will be in school for each fifth of the year, while the fifth division will be on vacation.

Four clerkships are set up for the junior year, one for each division in attendance. These are primarily in-patient clerkships and will be in general medicine, surgery, pediatrics and neuropsychiatry. They will extend through 73 days, and divisions will rotate until each will have completed all four clerkships by the end of the junior year.

In the senior year, the students will spend a fifth on the Obstetrics-Gynecological clerkship, and the other three-fifths in a rotation through the various out-patient clinics.

The didactic work missed in the junior year by a division on vacation will be made up by shifting the vacation period in the senior year, so that it will be in a different fifth from that in the junior year, and having the seniors attend junior didactic classes during that corresponding period. Similarly, the junior divisions each will anticipate the senior vacation by attending the senior classes during the fifth corresponding to that in which they will be out of school the following year.

The curriculum, in general, for the junior year will include: whole-class exercises in pediatrics, internal medicine, general surgery, neuropsychiatry, radiology, pharmacology and orthopedics; and in-patient clerkships in general medicine, general surgery, pediatrics, neuropsychiatry.

The curriculum for the senior work will include: whole-class exercises in dermatology, obstetrics and gynecology, ophthalmology, otolaryngology, urology and orientation to practice. Clinical work will consist of in-patient and out-patient clerkship in obstetrics and gynecology, and out-patient work in all departments.

All departmental theses will be discontinued, and instead seniors will be required to present before graduation one comprehensive thesis, on which they will work during their junior and senior years.

This new teaching plan has been worked out by Dr. J. C. McKinley and Dr. Irvine McQuarrie, and

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FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course will be offered four times during the year 1942, dates to be announced. Informal Course available every week.

GYNECOLOGY—Two Weeks' Intensive Course will be offered four times during the year 1942, dates to be announced. Clinical and Diagnostic Courses every week.

OBSTETRICS—Two Weeks' Intensive Course will be offered twice during the year 1942, dates to be announced. Informal Course every week.

OTOLARYNGOLOGY—Two Weeks' Intensive Course will be offered twice during the year 1942, dates to be announced. Clinical and Special Courses starting every week.

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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

THE ESSENTIALS OF OCCUPATIONAL DISEASES. Jewett V. Reed, B.S., M.D., F.A.C.S., and A. K. Harcourt, B.S., M.D., Indianapolis, Ind. 225 pages. Price, $4.50, cloth. Springfield, Ill.: Charles C. Thomas, 1941.

CANCER OF THE FACE AND MOUTH. Diagnosis, Treatment, Surgical Repair. Vilray P. Blair, M.D., Sherwood Moore, M.D., and Louis T. Byars, M.D. 599 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1941.

INFANT NUTRITION. A Textbook of Infant Feeding for Students and Practitioners of Medicine. Third Edition. Williams McKim Marriott, B.S., M.D. Late Professor of Pediatrics, Washington University School of Medicine; Physician-in-Chief, St. Louis Childrens Hospital. Revised by P. C. Jeans, A.B., M.D. Professor of Pediatrics, College of Medicine, State University of Iowa. 475 pages. Illus. Price, $5.50, cloth. St. Louis: C. V. Mosby Co., 1941.

THE MODERN TREATMENT OF SYPHILIS. Second Edition. Joseph Earle Moore, M.D. Associate Professor of Medicine, Johns Hopkins University, Physician-in-Charge Syphilis Division of Medical Clinic and



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Visiting Physician, Johns Hopkins Hospital, Baltimore; Special Consultant U. S. Public Health Service. With collaboration of Jarold E. Kemp, M.D., Harry Eagle, M.D., Paul Padget, M.D., and Mary Stewart Goodwin, M.D., all of Johns Hopkins University. 674 pages. Illus. Price, $7.00, cloth. Springfield, Ill.: Charles C. Thomas, 1941.

1941 Year Book of General Medicine. Edited by George F. Dick, M.D., et al. 848 pages. Illus. Price, $3.00, cloth. Chicago: Year Book Publishers, 1941.

Rheumatic Fever in New Haven. John R. Paul, M.D. Professor of Preventive Medicine, Yale University School of Medicine. 176 pages. Illus. Price, $1.00, paper cover. Lancaster, Pa.: Science Press Printing Co., 1941.

Diseases of Women. Ninth Edition. Harry Sturgeon Crossen, M.D., F.A.C.S. Professor Emeritus of Clinical Gynecology, Washington University School of Medicine; Gynecologist to Barnes Hospital, St. Louis Maternity Hospital, St. Luke's Hospital, etc.; and Robert James Crossen, A.B., M.D. Assistant Professor of Clinical Gynecology and Obstetrics, Washington University School of Medicine, etc., 948 pages. Illus. Price, $12.50, cloth. St. Louis: C. V. Mosby Co., 1941.

Functional Pathology. Leopold Lichtwitz, M.D. Chief of the Medical Division of the Montefiore Hospital; Clinical Professor of Medicine, Columbia University, New York. 567 pages. Illus. Price, $8.75, cloth. New York: Grune & Stratton, Inc., 1941.

The Doctors Mayo. Helen Clapesattle. 812 pages. Illus. Price, $3.75, cloth. Minneapolis: University of Minnesota Press, 1941.

ENDOCRINE THERAPY IN GENERAL PRACTICE. 3rd edition. E. L. Sevringhaus, M.D., F.A.C.P., Professor of Medicine, University of Wisconsin. Chicago: Year Book Publishers, 1940.

The author has succeeded in presenting briefly and clearly the various endocrine disorders. He stresses their practical treatment on an endocrine basis. The fact that the endocrine problems of childhood and puberty are discussed adds to the value of the text.

The arrangement is systematic and the style makes the book easy to read. Numerous photographs of clinical cases serve to enhance its value. The treatment of glandular disturbances is simplified for the general practitioner by giving the names of the numerous commercial preparations.

Russell J. Moe, M.D.

* * *

SULFANILAMIDE AND RELATED COMPOUNDS IN GENERAL PRACTICE. Wesley W. Spink, M.D., Associate Professor of Medicine, University of Minnesota. Chicago: The Year Book Publisher, 1941. 256 pages. Illus. $3.00.

The author, who is associate professor of medicine at the University of Minnesota, has written a volume in the series of General Practice Manuals put out by the Year Book Publishers.

The book is written in a concise manner and there is a very complete bibliography. The chapter on General Principles of Therapy takes up the chemistry of the sulfonamides and contains directions for the determination of concentration of the compounds in the

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body fluids and a table setting forth the conditions for which the different drugs are preferred; there is also a table of the diseases in which the sulfonamides are of no value.

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This is a practical and complete manual which is very timely and should prove valuable to the profession as a whole.

JAMES R. MANLEY, M.D.

SHOCK TREATMENT IN PSYCHIATRY: A Manual. Lucie Jessner, M.D., Ph.D., and V. Gerard Ryan, M.D. 149 pages. Price $3.50. New York: Grune & Stratton, 1941.

Shock therapy has opened a new era in psychiatry. Many questions still remain unanswered, and many changes will continue to be made, but shock treatment in some form or other is here to stay.

This book is a clear, concise and up-to-the minute manual on insulin, metrazol and electrical shock treatments. It also describes some of the more recent modifications of the pharmacological and electrical shock therapies. The section on each of these methods includes a short historical background, a detailed description of the techniques, a discussion of the changes which take place, and an impartial discussion of the merits of each. Comparatively less space has been given to the electrical shock methods since they were most recently developed and, therefore, they have been used less extensively and their comparative value has not yet been accurately evaluated. The authors of this book give a good description of the electrical-convulsive and the faradic shock therapies and they believe that these methods offer promise in the therapy of mental disorders.

This book should be of great value for the specialist who has not been able to follow the extensive current literature on this subject and for the practitioners who wish to acquaint themselves with those new therapeutic procedures which are now being employed by most psychiatrists.

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